NOV 4 1909

THE IRON AGE

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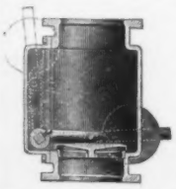

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SEE PAGE 34

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THE IRON AGE

New York, Thursday, November 4, 1909.

THE BRYANT CHUCKING GRINDER.

The grinding machine illustrated is of a new type in which principles underlying the design of the turret lathe, with its semi-automatic features, have been applied. It is intended by its builder, the Bryant Chucking Grinder Company, Springfield, Vt., to produce chuck work on a manufacturing basis, accomplishing all operations by grinding wheels instead of cutting tools, thus securing greater accuracy and better finish. This may be done either from the rough or from surfaces previously obtained in turret lathes and afterward hardened. The machine will grind either outside or inside diameters, together with the faces of both internal and external shoulders. Its scope includes both cylindrical and conical shapes. The capacity is up to 12 in. diameter and 12 in. long.

There are three grinding spindles. The standard equipment comprises 10-in. wheels on the front spindle for outside work; 6-in. wheels on the rear spindle for either outside or inside work or face grinding, and 2½-in. wheels on the middle spindle for internal grinding. These sizes may be varied to meet requirements, but the design regularly furnished gives to each spindle the speed required for the diameters of the wheel as stated. An auxiliary fourth spindle, not shown, is furnished as a fixture to carry still smaller wheels for internal work, being designed to enter a ¾-in. hole if desired. It may

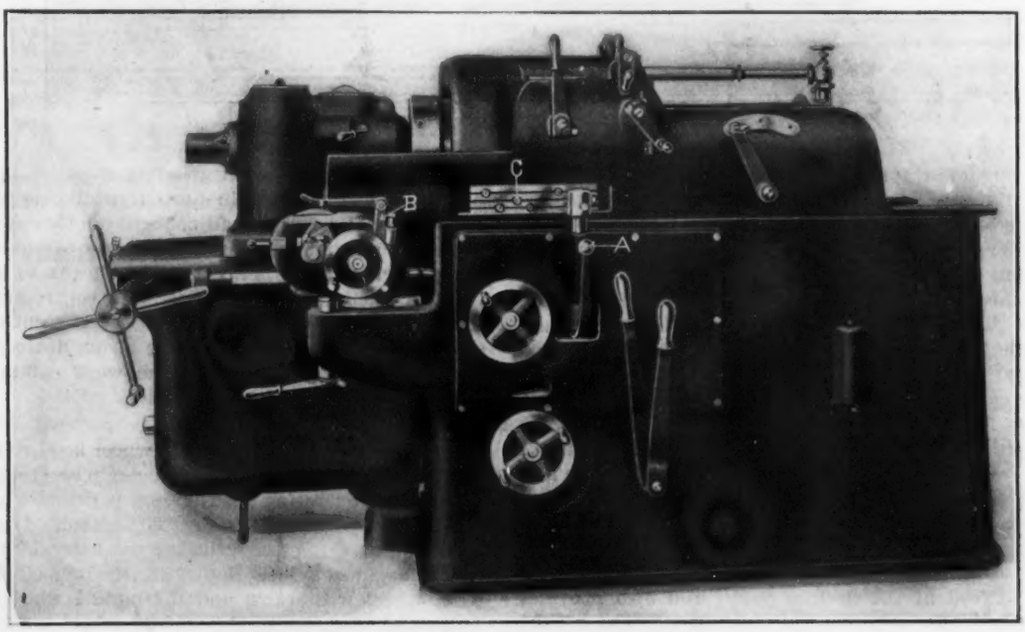


Fig. 1.—Front View.

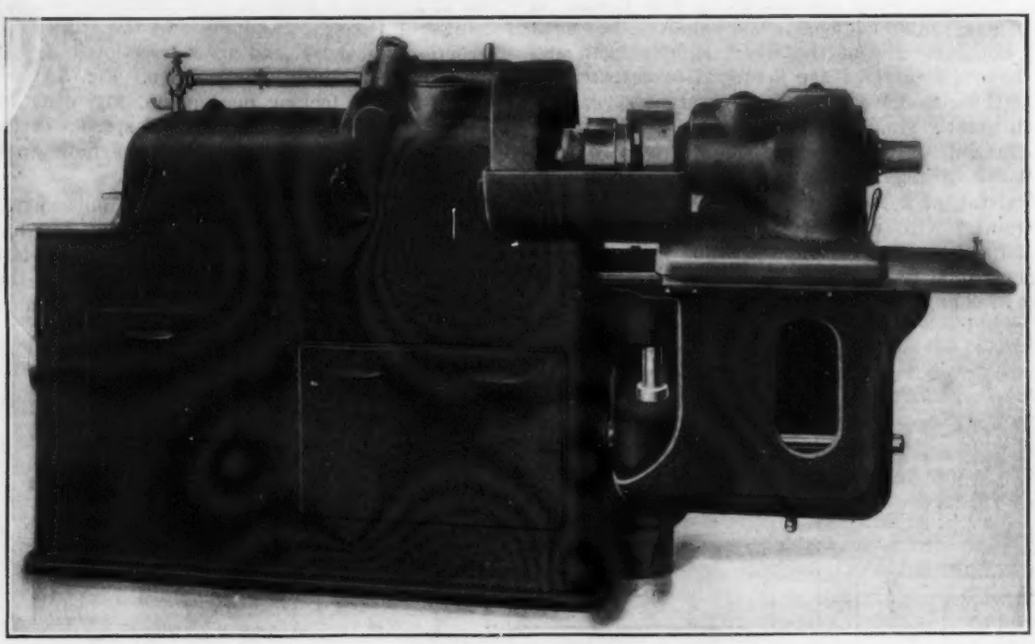


Fig. 2.—Rear View.

The New Grinding Machine Built by the Bryant Chucking Grinder Company, Springfield, Vt.

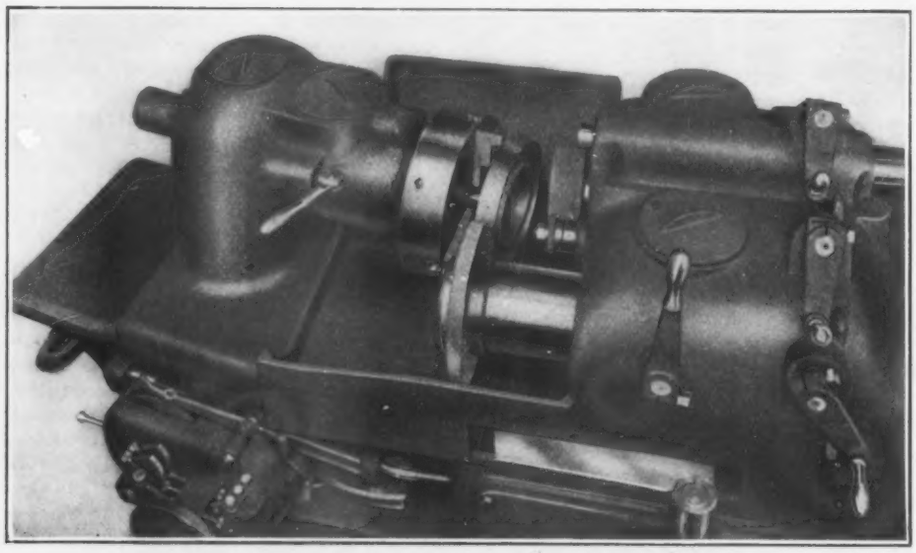


Fig. 3.—Detail of the Working Parts, Showing a Setting for Taper Grinding.

also be employed for buffing and for outside grinding. A rigid fixture, clamped to the back of the machine, holds the wheel in front of the central spindle. The wheel is swung into and out of working position without interfering with the use of other wheels.

The three grinding spindles are carried in the head carriage. The turret feature is absent. The spindles are adjustable lengthwise in heavy sleeves, for position, and are locked rigidly while operating. The wheel feed is with the carriage slide only; that is to say, longitudinal. The cross feed is in the head, carrying the work, which is held either in a chuck or spring arbor, on a massive spindle. In other words the stroke is in the wheel carriage, the feed in the work carrier. A variable speed mechanism actuates the traverse movement of the wheel carriage. The feeding mechanism of the work carriage permits of a wide range of feeds; automatically releases the feed at the desired point, and also provides for automatically reducing the amount of feed as the work approaches completion, the point of release and the degree of reduction being determined by cam forms. A gear box gives nine changes of speed for the work spindle. Both traverse of the wheel spindle head and feed of the work carriage are arranged to reverse.

The machine is driven from one constant speed pulley, which greatly simplifies the overhead works. This drive is transmitted to the wheel spindles by two belts only, and the arrangement is such that only one spindle is revolving at a time, or all are idle. The wheels are so grouped with reference to the work that each holds a natural position for the operation it is intended to perform, which reduces to a minimum the amount of adjusting in changing from one operation to another.

The operation of each grinding wheel is independent of the others, not only in that it revolves alone, but in its individual lever for adjustment to the work and in its knock off and reversing dog in the carriage. In the work carriage there is a cam and stop pin to govern the feed for each spindle. In fact, the control is equal to that of modern turret lathe practice, in securing facility and accuracy in the manufacture of duplicate parts. An auxiliary or length slide for the work carriage assists in the convenience of manipulation.

Figs. 1 and 2 show front and rear views of the grinder, and Fig. 3 the machine with wheel hood removed and a piece of work held in the chuck. The front wheel is extended to operating position and is grinding an outside taper. The other wheels are withdrawn. For the next operation on this piece, grinding the hole, the work head would be swung into line with the wheel travel, the front wheel withdrawn and the middle wheel extended. This work completed, the middle wheel would in turn be withdrawn and the rear wheel carried out to face the end. Fig. 4 gives a front sectional elevation, with details of the wheel spindle and the work spindle construction and drive, and an end sectional elevation, with details of the wheel spindle drive. Fig. 5 shows details of the spindle locking mechanism, Fig. 6 details of the Hartness gear box, and Fig. 7 the spindle carriage feed. In Fig. 8 the various operations of grinding a hardened gear are demonstrated.

The group of three spindles is a novel arrangement. They are fixed as to lateral movement, but have longitudinal traverse for adjustment. The drive is imparted to the shaft *a*, Fig. 4, which telescopes into the spindle *b*, the two being splined together. The spindle is jour-

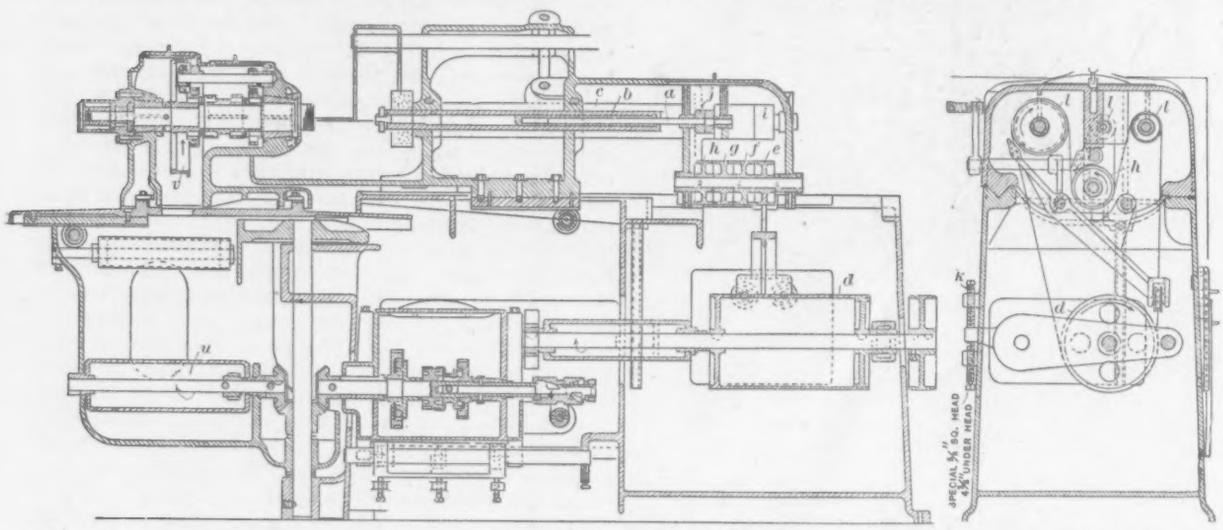


Fig. 4.—Side and End Sectional Elevations, Showing Details of the Wheel Spindle and Work Spindle Construction and Drive and the Speed Box.

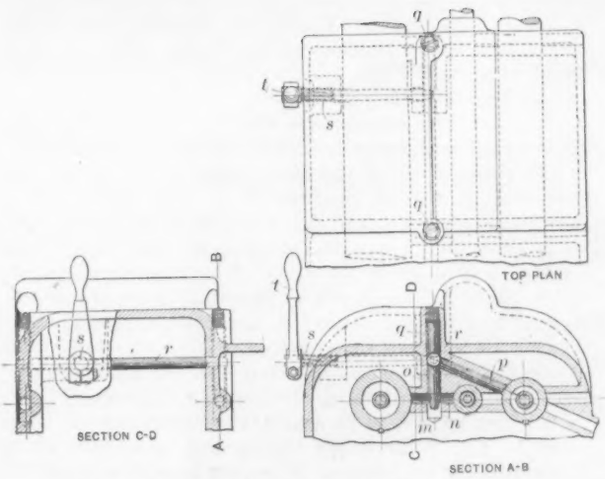
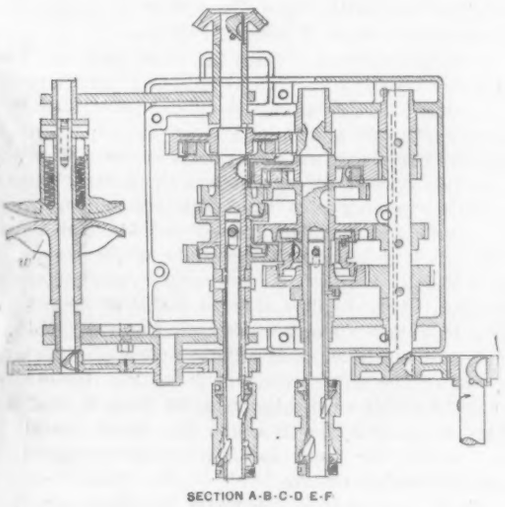


Fig. 5.—Details of the Spindle Locking Mechanism.

naled in a sliding sleeve, *c*, in which is cut a rack engaging a pinion operated by a hand lever. The feed of the wheel is with its carriage, by means of rack and pinion, operated through a variable speed drive, the Hartness system being employed, as seen at *w*, Fig. 6. The reverse of the head is secured through three dogs, C, Fig. 1, one for each spindle. The carriage is also moved by a hand wheel, which is thrown out of engagement automatically, when the power feed is thrown in.

The belt drive of the wheel spindle embodies an interesting design by which, though the driving belt runs continuously, at a constant speed, only one spindle is revolving at any one time, or all are out of operation. The driving pulley, which transmits power to all of the movements, has upon its shaft the drum *d*, Fig. 4. Each of the wheel spindles has tight and loose pulleys, of the proper diameter to give the correct peripheral speed to its wheel. A belt from the drum passes over the pulleys of the inner and outer spindles and over idler pulleys, shown at *e*, *f*, *g* and *h*. The middle spindle is driven by a belt from the idler *h*. It will be noticed that idlers *f* and *h* are keyed to the shaft, while their companions are loose.

When the belt is thrown on the loose idler *c* it drives the rear spindle, as in this position it is on the tight pulley *i* of that spindle. No drive can be imparted to the other spindle, for the idler shaft is still. To drive the front spindle, not shown, the belt is brought to the loose idler *g*, in which position it passes over the tight pulley of this spindle, which pulley is in the reverse position toward its idler, as compared to the arrangement of the rear spindle. To drive the middle spindle the main belt is thrown upon the tight idler *f*, imparting motion to the idler *h*, upon which is the belt to the middle spindle. Throwing this belt from the loose to the tight pulley *j* of the spindle puts it in operation. The belts are shifted by two levers, one for the main belt, the other for the belt to the middle spindle. The wheel spindle drum *d* is carried in a yoke, which is pivoted at one end and is adjusted vertically to tighten the belt by the screw *k*, Fig. 4.



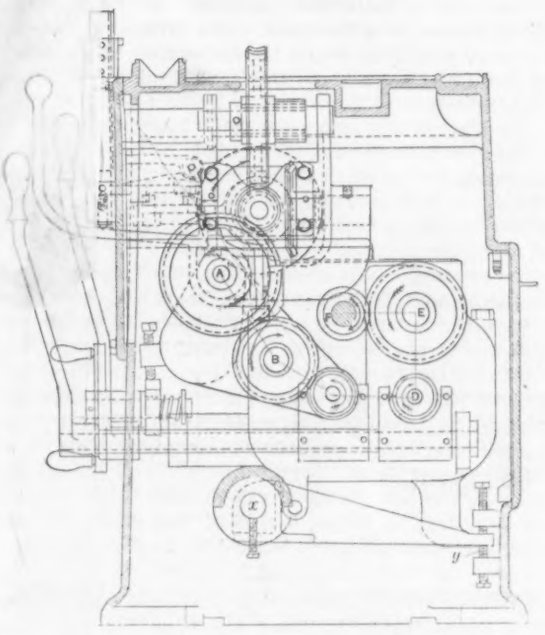


Fig. 6.—Details of the Gear Box.

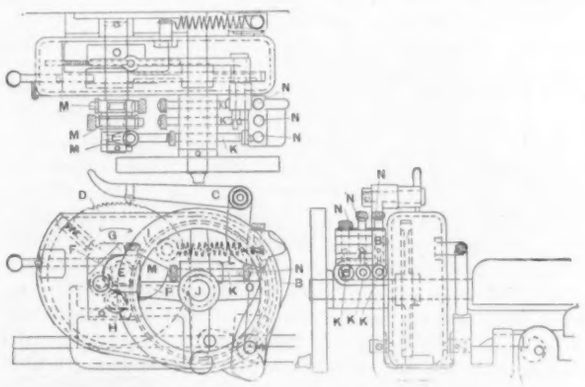


Fig. 7.—Details of the Spindle Carriage Feed.

The adjustment of the wheel to the work is accomplished through a rack cut in the sleeve of each spindle and a pinion *l*, operated by a shaft set at an angle to bring the lever handle in convenient position at the front. Each handle is arranged to be brought in contact with a stop when at the working position.

A whiffletree motion is used in locking the spindles. The clamping is both front and rear, and is accomplished by the throw of a single lever. The details of this mechanism are given in Fig. 5. The pins *m* and *n* are in contact respectively with the sleeves of the front and middle spindle, and are actuated by the taper pin *o*. The pin *p* is in contact with the rear spindle. The opposite ends of pins *o* and *p*, and also the plug *q*, are beveled to take the wedge pin *r*, which in turn is operated by the screw *s* through the lever handle *t*. The motion is transmitted simultaneously to both ends of the sleeve.

The work spindle is driven by a constant speed belt from the drum *u*, Fig. 6, to the pulley *v*. The drum is on a shaft driven through bevel gears engaging an idler on a vertical shaft, this arrangement being necessary to permit of the swiveling of the head. The drive is from a speed box, shown in Fig. 6, designed under the Hartness patents. There are nine changes of speed, obtained through two levers. It will be seen from this drawing that the variable speed of the wheel spindle head, obtained at *w*, is driven direct from the main driving shaft of the speed box, and consequently the ratio of speed of the grinding wheel to the speed of revolution of the work is constant. The traverse of the wheel head varies from 1-16 to 5/8 in. per revolution of the work spindle. The

spindle speeds range from 18 to 180 rev. per min. The gear box is assembled as a separate unit. For convenience in bringing the bevel gear drive up a horizontal and vertical adjustment has been arranged through a yoke, which is pivoted at *x*. The vertical adjustment is through the screw *y*. A second screw at the rear works in the yoke to secure horizontal adjustment.

The cross slide power feed mechanism is unique. It is operated by a screw and nut on a shaft, which also has a hand wheel for hand feed. The feed is actuated from the reverse yoke in the power box, controlled by the lever A, Fig. 1, through a telescopic shaft, which imparts a slight rocking motion to the bell crank B, on which is the ratchet arm C, Fig. 7, in which view the details are best shown. The stroke of the bell crank, in other words the amount of feed, is determined by stop pins in combination with the cams, the latter also providing for a diminuation of feed with the approach of the end of the work, the purpose being to give a finer finish during the final strokes.

The ratchet arm C engages the large ratchet wheel D, keyed to the shaft E. On this shaft is also the gear F, which engages either the gear G or, through an idler, the gear H, provision being made for throwing either gear into mesh with the large gear I, on the feed shaft J. If the gear G is engaged the feed is direct; if the gear H, the reverse feed is obtained. By means of this train

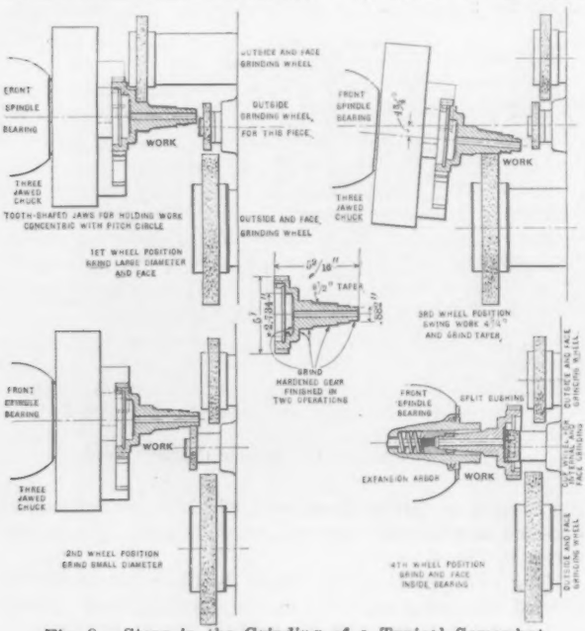

FRONT SPINDLE BEARING
WORK
THREE JAWED CHUCK
TOOTH-SHAPED JAWS FOR HOLDING WORK CONCENTRIC WITH PITCH CIRCLE
1ST WHEEL POSITION GRIND LARGE DIAMETER AND FACE
OUTSIDE AND FACE GRINDING WHEEL
OUTSIDE GRINDING WHEEL FOR THIS PIECE
OUTSIDE AND FACE GRINDING WHEEL
3RD WHEEL POSITION GRIND WORK 4¾" AND GRIND TAPER
GRIND HARDENED GEAR FINISHED IN TWO OPERATIONS
FRONT SPINDLE BEARING
WORK
THREE JAWED CHUCK
2ND WHEEL POSITION GRIND SMALL DIAMETER
FRONT SPINDLE BEARING
SPLIT BUSHING
EXPANSION ARBOR
WORK
4TH WHEEL POSITION GRIND AND FACE INSIDE BEARING

Fig. 8.—Steps in the Grinding of a Typical Somewhat Complicated Piece of Work.

the impulse of the ratchet is imparted to the feed screw.

The stop pins K, one of which, as well as one of the cams, is furnished for each wheel spindle, are mounted to slide in the casting at L, each in line with its cam M, and with its stop plug N in the bell crank. The bell crank is always under spring pressure, bringing the nut O of the stop pin against the casting L, except when the cam interferes. The position of this nut on the pin determines the throw of the ratchet arm and consequently the number of teeth that it engages; in other words, the degree of feed. It will be seen that it is an easy adjustment of feed.

The cam is shown engaging its stop pin and forcing it back, and with it the bell crank, to a position where the rocking motion fails of engagement and the ratchet does not work. During the beginning of the work the cam, because of its form, is revolving out of contact with the stop pin, and this relation between them continues until completion is approached, when the curved surface of the cam at P begins to ride on the pin, forcing it back, reducing the feed, and finally stopping the feed at the predetermined point. The decrease is entirely automatic. For example, the nut on the stop may be set for a feed of six teeth a stroke, which will continue until the cam reduces it, in successive strokes, to 3, 2 and 1 teeth, and, finally, to idleness. The feeds range from 0.0001 to 0.002 in. Each cam holds a screw which engages a worm gear, by means of which angular adjustment is given the cams.

The auxiliary carriage for the work head serves only to secure convenience in adjusting and in operating, bringing the work to the outer position for measuring, calipering, &c. It is operated by a hand wheel, and is provided with stops, one for each grinding wheel. The work head has a one-rail control, the back gib being merely to hold down the slide. The under gib control of the auxiliary carriage is so placed as to be practically in line with the gib control of the main carriage, eliminating all tendency to spring. The slide base is pivoted at one end of the wheel carriage bed, the angular position being indicated by graduations in degrees.

An idea of the work which the machine will do is given in Fig. 8, in which the several operations on a hardened gear are shown. The gear is held in a chuck, having tooth-shaped jaws, which keep it concentric with the pitch circle. At R the rear wheel is grinding a shoulder; at S the middle wheel is grinding the smaller diameter, and at T the large wheel of the front spindle is grinding a taper, the workhead being set over 4¾ degrees. At U the gear is removed from the chuck and held in an expansion arbor, while the small wheel is grinding and facing the inside bearing.

The St. Louis Blast Furnace.

The only coke blast furnace in the State of Missouri is that owned by the St. Louis Blast Furnace Company, located in the southern part of the city of St. Louis on a valuable tract of land between the St. Louis, Iron Mountain & Southern Railroad and the Mississippi River. It was rebuilt in 1895, but its equipment has been so well maintained that it is modern in its appointments, producing annually about 60,000 tons of pig iron. This is an excellent output for the size of the stack, which is 15½ ft. in diameter at the bosh and 76 ft. high. It is blown by two new Macbeth engines, each 44 x 60 x 84 in., supplemented by a Tod engine, 40 x 48 x 84 in. A battery of seven boilers—of Sterling, Atlas and Kewanee make—furnishes the steam. The blast is heated by two Gordon three-pass stoves, one Massicks & Crooke and one Whitwell four-pass. A bin system has recently been installed for handling the ore, coke and limestone, the charging buggies passing under the bins for direct loading, thus avoiding hand shoveling.

While the plant has an abundant supply of water, being located on the bank of the Mississippi River, the muddy condition of the water has impelled the installation of a clarifying system, in addition to the regular settling basin. The company operates its own electric light plant and does its own switching of cars. A well furnished laboratory is an important and essential part of the equipment of the works, as, aside from the numerous analyses which are constantly being made of the ore, coke and limestone, this company has in vogue a very liberal system of analyzing its product, every pound of which is sold on analysis. In addition to the usual repairs, the shops make the steel buggies for handling raw materials and build cars for use at the mines.

The product now turned out by this furnace is low phosphorus and high manganese basic and car wheel pig iron, produced from red and brown Missouri ores, which run from 50 to 60 per cent. in metallic iron. Arthur P. De Camp, who has for many years been identified with this furnace, is president of the company; Frank B. De Camp is vice-president and general manager; William Yule is secretary; Alexander Yule is assistant secretary and Sherwood S. Cunning is superintendent. The De Camp Brothers Yule Iron, Coal & Coke Company, St. Louis, is exclusive agent for the sale of the iron, most of which is used by local foundries.

The amount of spelter called for in the specifications of the Pennsylvania Railroad Company for galvanized roofing is 4 oz. per square foot of sheet metal, which would mean 2 oz. per square foot of surface coated.

An Eminent Scotch and a Great American Engineer.

The First Clyde Steamboat Builder and the Dry Air Blast Inventor.

An interesting episode in the family history of James Gayley, the distinguished American engineer, inventor of the dry air blast, has come to our attention. It has a peculiar value at this time in view of the recent celebration of the Robert Fulton centennial. Henry Bell, afterward Sir Henry Bell, a great uncle of Mr. Gayley, the brother of his grandmother, established steam navigation on the Clyde, having built the first successful steamboat to run on that river. Mr. Gayley has in his possession an antique print by a Glasgow engraver which shows Mr. Bell's steamboat, the Comet, a reproduction of which is given herewith. Mr. Bell's achievement is worthy of being placed beside that of Robert Fulton. The following biographical sketch of this noted Scotch inventor is taken from the ninth edition of the Encyclopedia Britannica:

"Henry Bell, a mechanical engineer, well known for his successful application of steam power to the propulsion of ships, was born at Torphichen, in Linlithgowshire, in 1767. Having received the ordinary education of a parish school, he was apprenticed to his uncle, a millwright, and, after qualfying himself as a ship modeler at Bo'ness [Borrowstounness, on the Firth of Forth] went to London, where he found employment under Rennie, the celebrated engineer. Returning to Scotland in 1790, he first settled as a carpenter at Glasgow, and afterward removed to Helensburgh, on the Firth of Clyde, where his wife superintended a large inn, together with the public baths, while he pursued his mechanical projects and also found occasional employment as an engineer. It was not until January, 1812, that he gave a practical solution of the difficulties which had beset all previous experimenters, by producing a steamboat (which he named the Comet) of about 25 tons, propelled by an engine of 3 hp., at a speed of 7 miles an hour. Although the honor of priority, by about four years, is admitted to belong to Robert Fulton, an American engineer, there appears to be no doubt that Fulton had received very material assistance in the construction of his vessel from Bell and others in this country. A handsome sum was raised for Bell by subscription among the citizens of Glasgow, and he also received from the trustees of the River Clyde a pension of £100 a year. He died at Helensburgh, November 14, 1830, and a monument was erected to his memory at Dunglass, near Bowling, on the banks of the Clyde."

While the Scotch engineer achieved distinction in introducing steam navigation on the Clyde, the American engineer has won laurels in another direction. Mr. Gayley's invention of the dry air blast is undoubtedly one of the most important contributions to metallurgy in this stage of the world's progress. It is a great feat to be able to secure the important saving in the cost of producing pig iron which the dry blast has accomplished. America has long been indebted to Europe for epoch-making inventions in the metallurgical field, such as the Bessemer, the Siemens-Martin and other processes, and it is through Mr. Gayley that we have offset our borrowing of European ideas with the dry air blast, which is a strictly American invention.

Reproduction of an Old Print of the Comet, the First Steamboat on the Clyde, Scotland, Built by Henry Bell.

Boilers Fired with Coal Dust.

In the London *Times Engineering Supplement* some facts are given concerning the Bettington boiler, designed by Fraser & Chalmers, Ltd., to meet the difficulties encountered with a boiler using coal dust as fuel. These difficulties include the securing of continuous and steady ignition, employing a material to withstand the destructive temperature necessary in the furnace, maintaining a homogeneous mixture of fuel dust and air during the full period required for complete combustion, and handling the molten ash. In the Bettington boiler a vertical gas jet inlet is employed, so constructed that a mushroom shaped flame is produced within a line of water tubes which are part of the steam producing plant. Otherwise only the ordinary firebrick and metal work are employed as material. The combustible mixture enters the gas along the central axis of the furnace. The continuous ignition of the incoming stream of dust and air is effected primarily by the enveloping sheath of the products of combustion, and ignition is made independent of the incandescent brickwork. The furnace is stated to keep itself clear of slag at all rates of combustion.

At the Erith Works of Fraser & Chalmers a boiler of this kind has been in operation for some months. It has 2200 sq. ft. of heating surface, with a single 12¾-in. tuyère fed with pulverized coal and air by a fan below a ball mill pulverizer. Its calculated capacity was 7000 lb. of steam per hour, but it has actually worked up to 15,000 lb.

The section of mining and metallurgy of the Franklin Institute, Philadelphia, will meet on the evening of November 4, on which occasion the introductory address of the president of the section, Professor A. E. Outerbridge, Jr., will be on "The Mineral Wealth of the Islands of Newfoundland and Jamaica," illustrated. Professor Bradley Stoughton will also deliver an illustrated lecture on "The Open Hearth Process."

The New York Gas Producer and Gas Engine.

The gist of the very exhaustive report made by the Committee on Gas Engines at the convention of the National Electric Light Association last June was that the gas engine is a thoroughly reliable machine when supplied with the proper kind of gas, and that the producer plant offers the chief source of difficulty at present. The gas producer illustrated in Figs. 1 and 2 is one its builder, the New York Engine Company, Watertown, N. Y., believes has overcome the difficulties. A proper mixture of gas and air in an unvarying quality was recognized as an essential and was made the keynote of the design. In the exterior view given in Fig. 1 is shown the complete gas producer plant, including generator, separator, drain tank, scrubber and gas tank. The same parts are shown in section in Fig. 2, but in reverse order, or as viewed from the opposite side.

In both views may be seen the vaporizer, which is a hollow annular casting bolted by its flange to the steel shell of the generator proper. Through its center pass all the hot gases distilled from the coal on their way to the separator and from its interior comes the water saturated air that is to take part in the production of gas. A downcomer pipe delivers the mixture of steam and air to the under side of the fire grate, and directly adjoining is the separator connecting through the vaporizer with the upper part of the generator on one side and through a second downcomer pipe with the scrubber on the other side. A three-way valve permits the passage of the hot gases either to the scrubber by the downcomer pipe or by the purge pipe to the outer air. This purge pipe is in line with the downcomer pipe and extends vertically some 30 ft. to insure a proper draft when the engine is not working. The lower part of the separator enters the drain tank and in this receptacle are deposited many of the small particles carried over from the generator by the gas.

In the scrubber the course of the cooling water is downward, while the course of the gas is upward. The scrubber is filled with coke, the larger pieces being placed at the lower part and the smaller ones on top. A continuous flow of cooling water provided by the small pipe shown in Fig. 2 trickles down continuously over the coke in the scrubber, washing the dirt deposited in the upper layers to the bottom until it finally accumulates at that point, from which it can be periodically drawn off. The hight of the scrubber is such that the gas in passing from the bottom to the top is cooled to nearly the temperature of the scrubber water when it leaves the sprinkler. From the upper part of the scrubber, through a third downcomer pipe, the cooled and cleaned gas passes into the gas tank.

The course of the gases is clearly indicated by the arrows in Fig. 2, where it is shown that part of the necessary air enters the generator through the outer end of the pipe that supports the hand blower under the control of a swinging damper; this is dry air. Another portion of air enters within the vaporizer passing over the water therein contained and, combining with that water in the shape of steam, passes down the downcomer pipe to the under side of the fire grate to mingle with the dry air in correct proportions for the chemical reactions taking place within the hot zone of the generator. A swinging damper regulates the admission of air to the interior of the vaporizer.

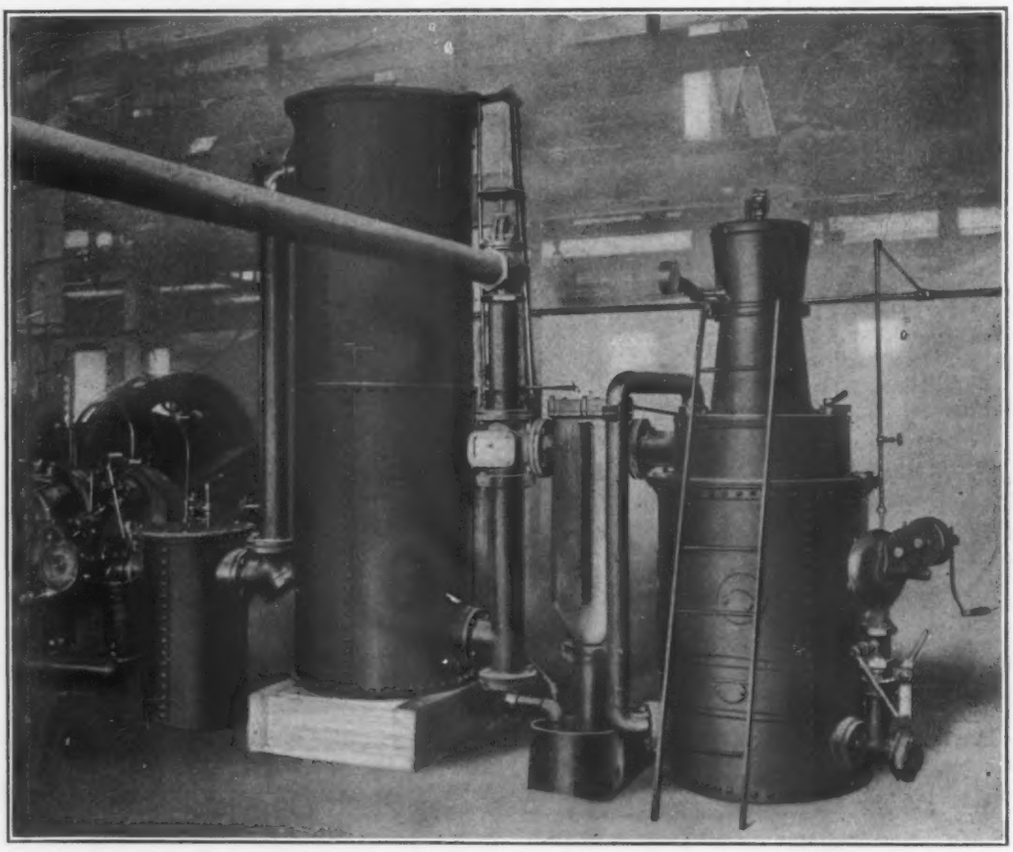


Fig. 1.—A Complete Suction Gas Producer Plant as Built by the New York Engine Company, Watertown, N. Y.

The efficiency of a producer is determined commercially by its ability to gasify successfully the largest possible amount of coal for a given weight of apparatus. One of these producer plants with a generator lining of only 20 in. internal diameter or 2.18 sq. ft. sectional area has kept up a constant gasifying rate of 58 lb. of ordinary commercial pea anthracite coal per hour for 10 hours. That is at an average rate of nearly 26 2-3 lb. per square foot of grate surface per hour for the whole day, including starting and cleaning. That the gas made throughout this time was of excellent quality is evident from the fact that the average indicated horsepower of the engine supplied was 78 all day long, the average mean effective pressure was 72, and the average consumption of pea coal per brake horsepower hour 0.88 lb.

The New York Engine Company having been a builder of steam engines and boilers for over 30 years, when it entered the gas power field had the advantages of man-

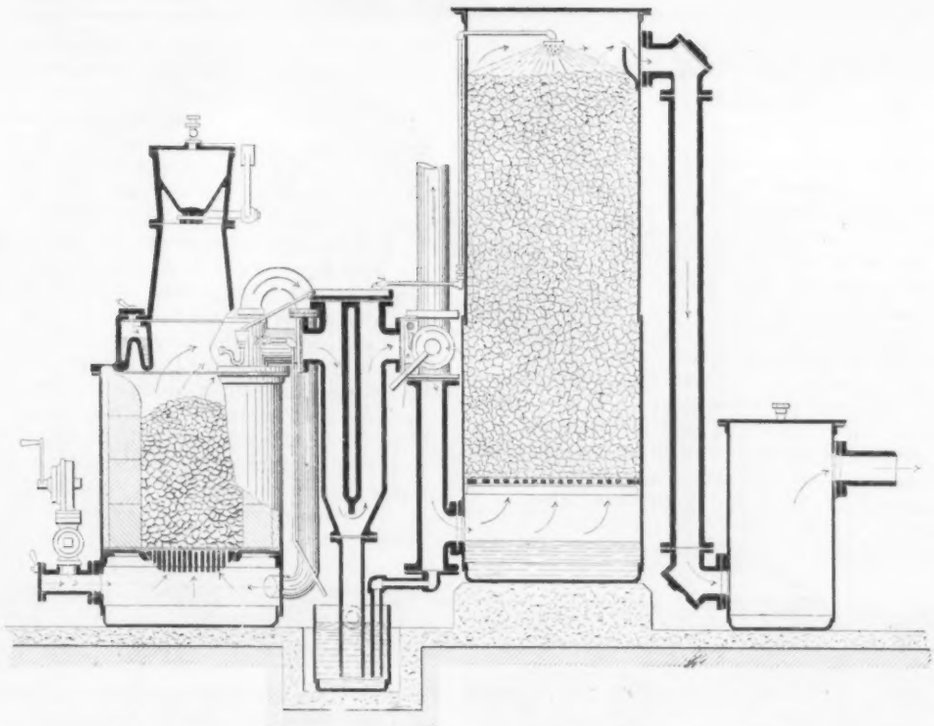


Fig. 2.—Sectional View of the New York Gas Producer Plant.

ufacturing facilities, a large amount of experience and an understanding of the requirements of power users. Primarily it was interested in gas engines, but realizing that satisfaction with the engine depended to so large an extent upon the gas supplied to it, it also undertook the building of the gas producer above described. The gas engine this company builds, shown in Figs. 3, 4 and 5, is one for which the three principal claims are reliability, efficiency and simplicity. That it is simple may be judged by the illustrations, and that it is efficient and reliable is shown by the following table of tests of a 56-brake horsepower engine.

Number of test.	Total coal used, including starting. Pounds.	Hours run.	Average brake horse-power.	Average coal per b.h.p. per hour. Pounds.	Weight of ash. Pounds.	Per-centage of ash.
1	570.37	9¾	54.66	1.07	130	22.80
2	592	10½	57.20	0.98	137	23.15
3	580	10	66.20	0.876	140	24.12
4	498	8½	53.8	1.08	95	19
5	525	9	61.96	0.94	102	19
6	580	10	65.78	0.88	145	25
7	550	10	60.13	0.90	110	20

Most of the details of the valve gearing, governor, ignition, lubricator, indicator, reducing motion and crank pin lubricator are clearly revealed in the views given in Figs. 4 and 5, while the construction and internal arrangement are made especially prominent in the sectional view given in Fig. 3. The mixing or inlet valve housing is bolted to the top of the explosion chamber and carries a bracket for its rocking lever as well as a guide for its valve stem. Two helical springs attached to a yoke secured to the upper ends of this valve stem insure the rapid seating of the valve. The outer end of the inlet or lifting valve rocker engages with the upper end of a push rod, which reciprocates vertically through a long guide. This guide is a part of the cover plate that gives access to the water space of the explosion chamber. This vertical push rod performs two functions; it actuates the inlet valve through a rocking lever and also the gas valve when the governor permits. As may be seen, a projecting arm just below the lower end of its guide engages with another shorter push rod, the

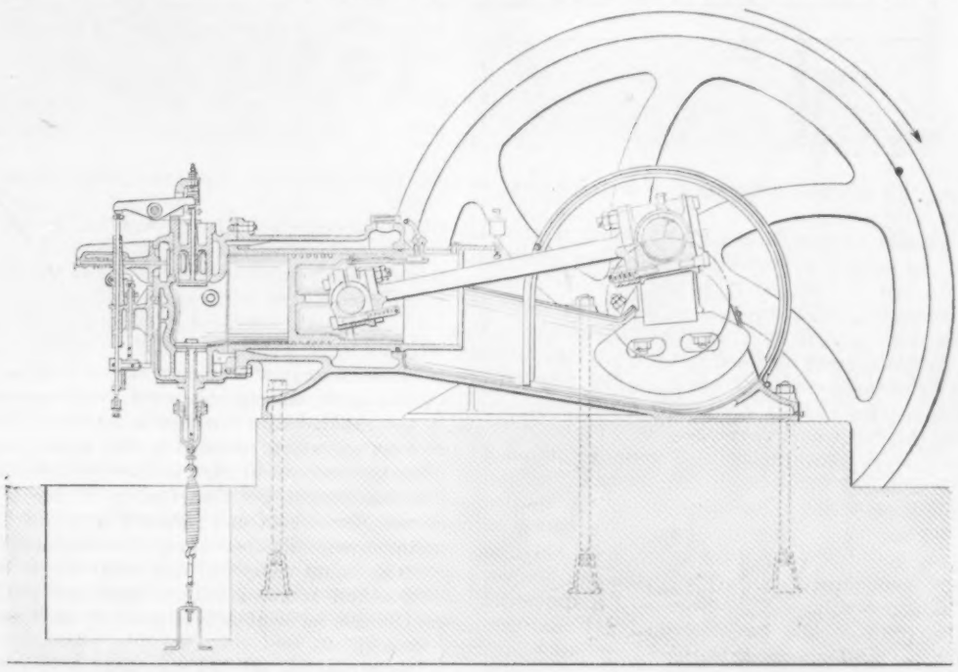


Fig. 3.—Sectional View of the New York Producer Gas Engine.

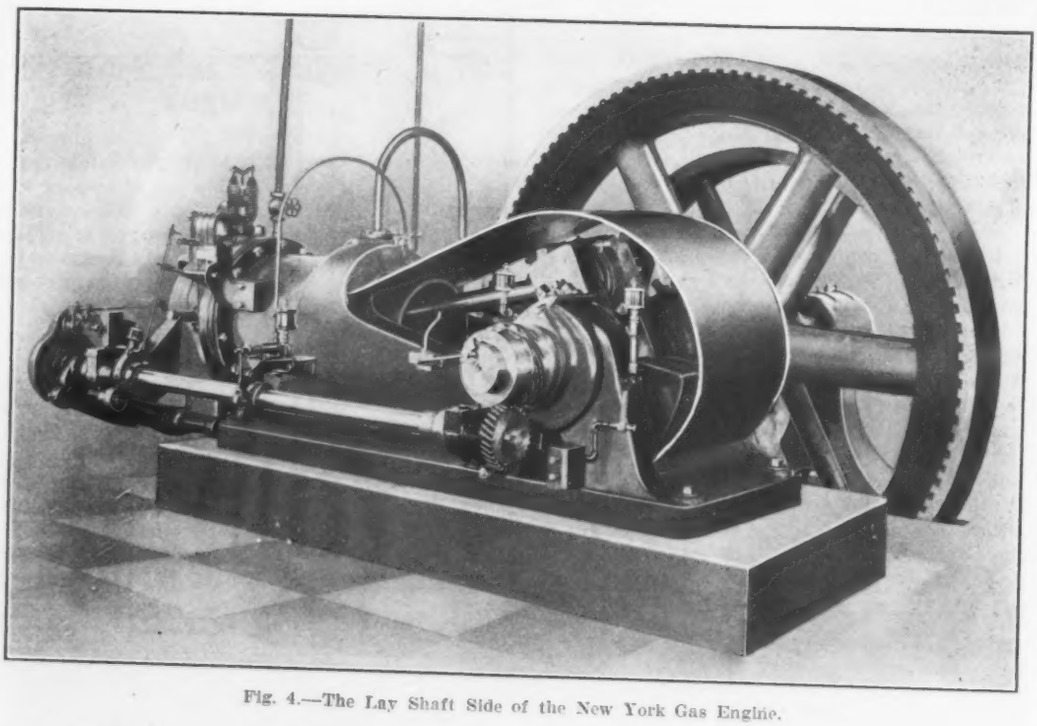


Fig. 4.—The Lay Shaft Side of the New York Gas Engine.

upper end of which actuates the gas valve rocking lever. The stem of this latter valve is horizontal and is supported at its outer end by a bracket cast on the gas valve housing. A single helical spring surrounding the valve stem reseats this valve with sufficient rapidity as soon as the pressure of the push rod is withdrawn.

The hit-or-miss type of governing is employed, explosions being skipped whenever the speed exceeds a predetermined limit. The builders regard this system of governing as superior to those of altering the quantity or richness of the charge, because the best power impulse is obtained in any gas engine from a nearly full cylinder of a gas mixture of constant proportions. The governor spindle rotates in a horizontal position, being spur gear driven from the end of the cam shaft. The speed secured by the ratio of this gearing makes it highly sensitive though of small size. All the work that it has to perform is to introduce or remove the latch that enables the inlet valve push rod to simultaneously actuate the gas valve push rod or leave it undisturbed. This work being exceedingly small, the governor may be made nearly isochronal. Any speed governing device must run faster before the engine is caused to run slower, since change of speed is the actuating force. The less work the governing mechanism has to do the smaller the speed fluctuations need be. When the speed exceeds the set amount the governor balls moving out withdraw the latch through the simple system of rods and levers shown. The inlet valve push rod is therefore not actuated and the gas valve during this particular stroke of the engine remains closed, the engine sucking in air alone and not a mixture of air and gas. The idle strokes of the engine are an advantage in that they serve to clear the interior of the cylinder from burnt gases by the fresh air taken in at that time, and also serve to cool the cylinder walls and valve heads. The next explosion consequent upon the slight reduction of speed resulting is that of a perfect explosive mixture of gas and air as before.

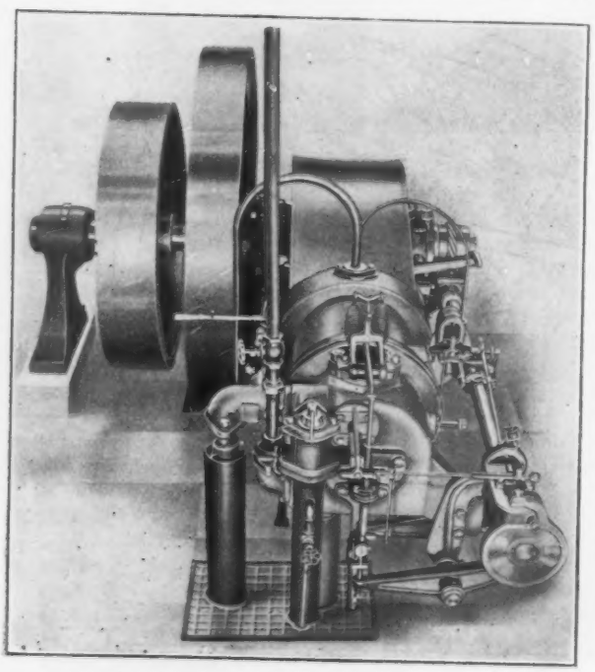


Fig. 5.—Cylinder End View of the Gas Engine.

The lower end of the inlet valve push rod is actuated by the main admission rocking lever, the roller of which may be seen in Fig. 4 directly in front of the governor gear case. The cam on the cam shaft engages with this roller, operating the entire admission valve mechanism once in every four strokes. Just to the front of the cam shaft bearing may be seen the exhaust valve rocking lever roller, with a pin projecting from the stud in the lever boss. Because of the high compression employed in normal running, about 200 lb. per square in, it is desirable to start the engine with its compression greatly reduced, and for this reason the exhaust cam is made wider than the exhaust lever roller, and in one part of its width is made with an additional cam projection to insure opening the exhaust valve slightly during the compression stroke. In starting the engine the exhaust lever roller is shifted along its stud until it engages with this double cam, and the pin shown is inserted in a hole in the stud to retain the roller in proper position. When the engine has obtained sufficient speed this retaining pin is withdrawn. The roller is shifted along the stud to its normal position, and the pin inserted in the stud on the other side of the roller. The eccentric adjacent to the exhaust cam operates a magneto, and through its rocking armature connection, the make-and-break spark plug, the case of which carries also the pipe attachment for the indicator. The timing of the spark may be altered, but when once properly adjusted should be left undisturbed. Further along the cam shaft is the force feed oil pump which delivers lubricant to the top of the piston, and at the front the indicator reducing motion, the details of which will readily be understood from Fig. 4.

As a rule the engines, particularly of the larger sizes, are arranged to be started by compressed air. The larger

engines are also arranged, as shown in Fig. 3, with the inner periphery of the fly wheel rim notched to facilitate turning the engine over by hand. The engine has a very complete and effective oiling system, supplying all of the rubbing surfaces and also, as may be judged from the sectional view, Fig. 3, a very thorough system of water jacketing.

The Chicago Duplex Feather Keyseating Machine.

A machine specially adapted for rapidly cutting keyseats in shafts and spindles is shown in Fig. 1. The duplex feather keyseating machine, as it is called, has been brought out by the Chicago Machine Tool Company, Chicago, Ill., and has many entirely original features.

In general appearance the machine resembles the combined vertical and horizontal milling machine made by the same company. The horizontal spindle is fitted with a taper arbor having a No. 9 B. & S. taper shank which fits a corresponding taper in the spindle and is held in place by a draw bar. This arbor has mounted on it the correct size of cutter for the desired width of feather keyseat. In the vertical spindle is placed an end mill of the correct size, held in place by a draw-in collet.

In Fig. 2 is shown the setting of the machine to perform the first operation of cutting a feather keyseat.

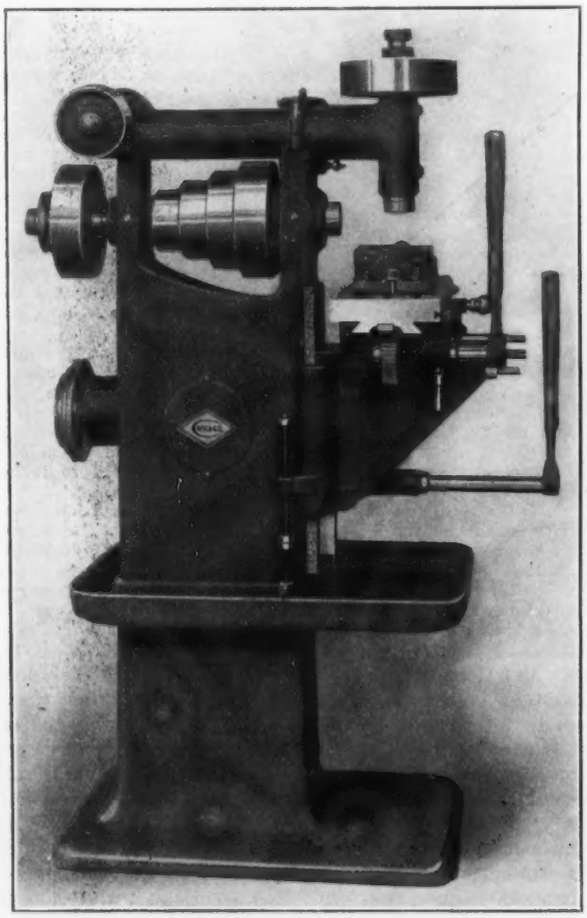


Fig. 1.—The Duplex Feather Keyseating Machine Built by the Chicago Machine Tool Company, Chicago, Ill.

A piece of shafting may be seen secured in the vise, and the milling cutter has milled out the keyseat, all except squaring up the ends. This second operation is taken care of by the vertical spindle. As is shown in Fig. 3, the table carrying the vise and shaft has been brought out directly under the end mill, held in place in the vertical spindle, by means of the hand crank transverse feed. Thus the end mill may be brought into play in squaring up the ends of the feather keyseat and finishing the work.

The two complete operations can be done without resetting the work or stopping the machine. Thus in

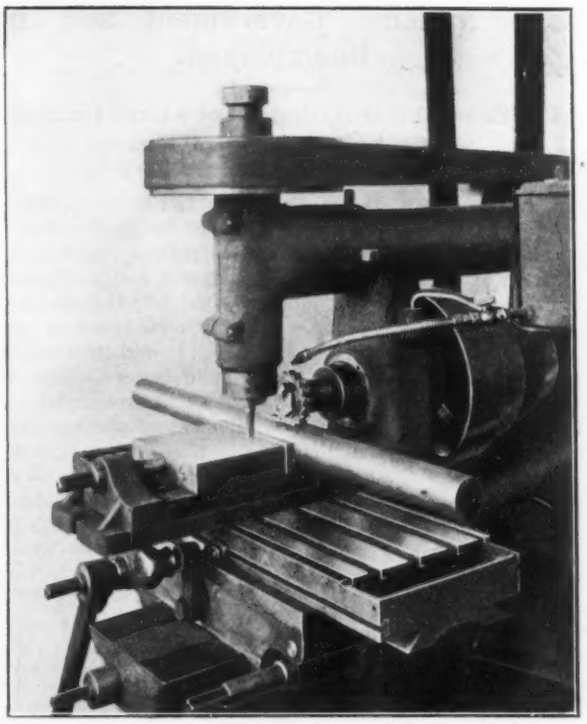


Fig. 2.—The Machine Set for the First Operation of Cutting a Keyseat.

reality it might be regarded as one continuous operation.

The machine is provided with six changes of power feed, as well as the crank and lever feeds, giving a sufficient range to cover all work for which it is adapted. The hand lever is used to quickly return the table after a cut has been taken. An adjustable automatic stop to the table feed is also provided, which may be set for the length of keyseat desired.

The knee of the machine has no opening on its top. This practically eliminates the tendency to spring when the saddle is clamped. The bracket which carries the nut for the transverse feed screw is connected to the table through a slot cast in the side of the knee.

The Chicago duplex feather keyseating machine is built in three sizes and two styles. Hill, Clarke & Co., Inc., of Boston and Chicago, are the selling agents.

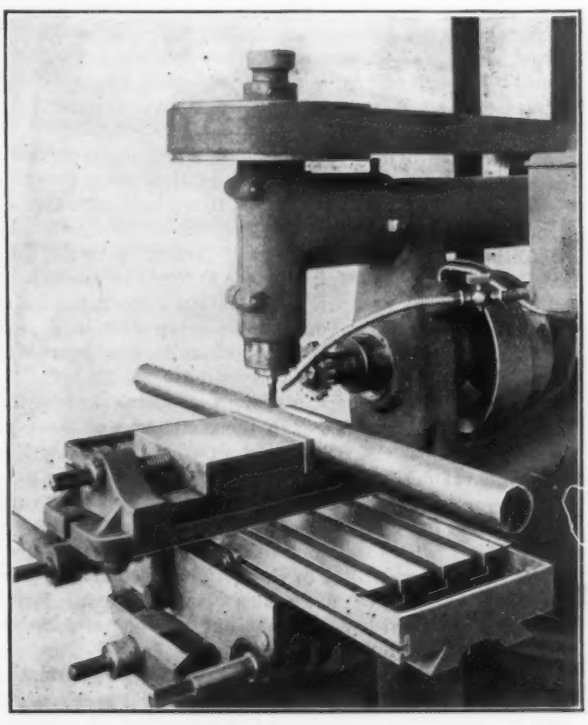


Fig. 3.—The Finishing Operation, Squaring the Ends of the Keyseat.

The National Government and the Unemployed.

The Beneficial Distribution of Aliens Hampered by Labor Organizations.

WASHINGTON, D. C., November 1, 1909.—Application for skilled laborers recently received by the Division of Information of the Bureau of Immigration and Naturalization of the Department of Commerce and Labor from manufacturers in many industries indicate that the function of the division under existing regulations is quite generally misapprehended. Although it was the intention of Congress that this division should undertake the collection and distribution of information designed to enable unemployed workmen of all classes, whether arriving immigrants or citizens of the United States, to find employment and, notwithstanding the excellent beginning which the division made on a broad and comprehensive basis, its work within the past few months has been restricted to a very narrow scope, and to-day the division limits its efforts to find employment for farm laborers and domestics.

Text of the Law.

The law under which the division was established is found in section 40 of the act of February 20, 1907, as follows:

It shall be the duty of said Division to promote a beneficial distribution of aliens admitted into the United States among the several States and Territories desiring immigration. Correspondence shall be had with the proper officials of the States and Territories and said Division shall gather from all available sources useful information regarding the resources, products and physical characteristics of each State and Territory, and shall publish such information in different languages and distribute the publications among all admitted aliens who may ask for such information at the immigrant stations of the United States and to such other persons as may desire the same.

The Division of Information was established on July 1, 1907. With a view of ascertaining where employment could be obtained by those desiring it, the various associations of manufacturers and individual employers of labor were written to, the idea being to secure information such as would be of benefit to arriving immigrants and others who desired to avail themselves of the services of the division. Through the manufacturers' associations the addresses of individual manufacturers and employers were obtained, and to each one a letter of inquiry was addressed, asking whether workmen were needed. Information was sought as to the class of labor, wages paid, the hours of employment and general conditions. The final question put to each employer of labor was: "Do strikes or other labor difficulties exist in your jurisdiction? If so, kindly state cause of same." An effort was also made to obtain the addresses of the various local labor organizations of the country, but without success, and letters of inquiry were therefore sent to the chief officers of the national and international trades unions asking them to advise the division as to labor conditions generally and as to disturbances in the labor world, the purpose being to place before the unemployed alien or citizen accurate information concerning industrial conditions in an unbiased manner and then leave it to the applicant to elect whether he would take advantage of the opportunity presented or not.

To reach the farmers, a system of postal card inquiry was established, and through the courtesy and co-operation of the Post Office Department cards were intrusted to the rural delivery carriers with instructions to place one in each box on their respective routes. These cards contained a brief statement of the aims and purposes of the division with directions to detach the return coupon, fill it in and forward it to the division if farm laborers, common laborers or mechanics were needed. Nearly 3,000,000 such cards were sent out without cost to the division or to the Government.

In order to make practical use of the information received and to comply with the letter and spirit of the law in promoting a beneficial distribution of admitted aliens and others, a branch office of the division was established in Pearl street, New York City, in charge of an inspector. All applications received by the division for laborers or workmen were at once recorded, classified, made up into bulletin form and forwarded each day to the branch office at New York where the inspector in charge was directed to place them before all persons applying for employment or information.

Opposition of Labor Organizations.

Notwithstanding the great care exercised by the officials of the division to confine their work to the collection and distribution of information regarding opportunities for employment and to observe strictly the letter and spirit of the immigration and contract labor laws, it was but a short time before the principal labor organizations of the country arrayed themselves in opposition to the division and its work, and it is largely to this opposition and the reluctance of the higher officials of the Department of Commerce and Labor to antagonize these organizations that the scope of the work of the division has been greatly restricted until, as above stated, it is now confined to the collection and distribution of information concerning opportunities for the employment of farm laborers and domestics.

At a conference held at the Department of Commerce and Labor a few months ago, President Gompers of the American Federation of Labor attacked the work of the division on the ground that it tended to stimulate immigration. The narrow view of the head of this great organization is fairly reflected in the following extract from his remarks:

I and my colleagues of the Executive Council have tried to do our share to co-operate as best we could in having that bureau as efficient as possible. But let me say that since then instances have arisen—more than likely without any fault of the chief—just grounds for suspicion have arisen as to the real purpose, and particularly the work, of the bureau. Some have, with good reason, complained that it was being turned into a labor bureau to help tear down existing standards of life even in industrial centers.

We know that shipping agents, railroad agents, land agents, agents for companies and corporations, and employers of all sorts have made it appear to the workers of these several countries that the United States has established a bureau that will find work for them when they come to the United States, and that, as a matter of fact, it has acted as a means to encourage and induce the workers of those countries to come to the United States, and they are only holding off until there shall come a rift in the clouds, an industrial revival, to overwhelm the ships that ply between foreign ports and our own. The South Carolina Legislature has under consideration, and, if I am not mistaken, has already passed, a law repealing the legislation of a few years ago by which a bureau was established to induce immigrants to come into that State.

Now we have every respect for the secretary and his assistants and chiefs in the various bureaus, but we do now believe that there must be some radical change either in the administration of the law or the law itself; some action must be taken, or should be taken, if the purpose of that bureau is to be carried out as we understood its purpose to be when it was created, that shall prevent it from being a vehicle to the great injury of America's workers.

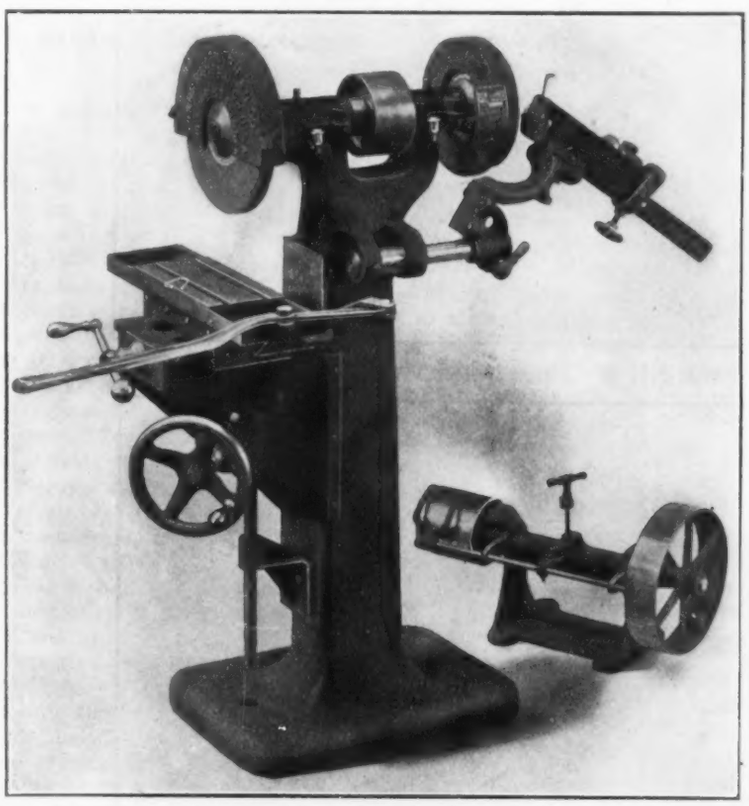
Mr. Gompers also presented a series of resolutions said to have been adopted by the Farmers' Educational and Co-Operative Union of America, protesting against the work of the Division of Information and urging "the speedy enactment of laws substantially excluding the present enormous alien influx by means of an increased tax money requirement, the illiteracy test and other measures, &c. At the same time Mr. Gompers presented a statement taken from the books of the various organizations affiliated with the American Federation of Labor, showing nearly 2,000,000 wage earners out of employment. Among the trades mentioned by him were the following: Boiler makers and iron shipbuilders, 30 per cent. unemployed; bridge and structural iron workers, 25 per cent.; elevator constructors, 40 per cent.; steam and hot water fitters, 40 per cent.; machinists, 20 per cent.; pattern makers, 30 per cent, shipwrights, joiners, etc., 50 per cent.; tin plate workers, 40 per cent.; iron molders, 70 per cent. Inasmuch as an important function of the Division as originally organized was to distribute information calculated to enable American citizens as well as arriving immigrants to find employment, Mr. Gompers's schedule would seem to constitute a fairly strong argument in favor of extending rather than restricting the work, but he insisted that the activities of

the Division would necessarily be injurious to labor in this country.

Work of Division Is Defended.

Mr. Gompers's statement was not allowed to go unanswered. T. V. Powderly, Chief of the Division of Information, and himself for many years prominent in labor movements, declared that the work of the Division was grossly misrepresented. He asserted that much of the criticism of the Division was based upon misinformation and, referring to the resolutions passed by the Farmers' Educational and Co-Operative Union of America, he called attention to the fact that they purported to have been passed January 8, 1908, whereas the Division had not directed a single individual to a place of employment prior to March 1, 1908. Concerning the character of the organization said to have adopted the resolutions, Mr. Powderly stated that the Division had made every effort to get into communication with its officers, but could not locate them, all the official communications referred to having been returned as uncalled for.

Reports have been industriously circulated by representatives of the labor organizations intimating that the Division of Information has undertaken to assist in the breaking of strikes by furnishing employees to take the places of the strikers. This is emphatically denied by the officials of the Division, and it is only fair to say that no evidence whatsoever has been produced in support of the intimations referred to. The Division has been in existence for so short a time that its activities are covered by comparatively brief records, which show at a glance that nothing of the kind complained of by the labor organizations has ever been attempted.



The Yankee No. 1 Surface Grinder with Tool Grinding Attachment, Built by the Wilmarth & Morman Company, Grand Rapids, Mich.

Legislation May Be Sought.

The coming session of Congress may witness an interesting contest between the friends of the Division of Information, and especially the manufacturers' associations, that would gladly see its functions broadened so as to include the dissemination of information regarding employment for skilled labor, and the officials of the leading labor organizations, one party seeking to have the Division put on a basis that would make it of real value to the employers of the country, while the other seeks the repeal of the law under which the Division was originally organized. In view of the efforts that will also be made by the labor leaders to secure special legislation governing the hours of labor, issuance of injunctions, &c., and the reluctance of the average public man to do more than assume a negative position with respect to such legislation, there would seem to be little prospect that the usefulness of the Division of Information will be materially increased in the near future. W. L. C.

The Yankee No. 1 Surface Grinder.

Surface grinders of moderate capacity that do highly accurate work and yet sell at a fairly low price have been wanting, according to the Wilmarth & Morman Company, Grand Rapids, Mich., and it was for this reason that the Yankee No. 1 surface grinder illustrated was introduced. Manufacturers having work to produce no larger than this machine will handle heretofore, it is stated, have either had to be satisfied with machines that did not grind to extremely exact dimensions or else purchase a larger and more expensive machine than their requirements seemed to justify. This grinder is declared to be as convenient to operate and to turn out as accurately sized product as the most expensive machines built. The working surface of the table is 6 in. wide by 12 in. long, and sufficient movement is provided so that the wheel fully clears the table on both sides and at both ends.

Both the transverse and vertical adjustments are graduated to thousandths of an inch and the divisions are coarse enough so that they can be easily subdivided when an especially highly refined degree of accuracy is desirable. Regularly the machine is equipped with a grinding wheel 12 in. in diameter by 1-in. face, intended to run at a speed of 1400 rev. per min. The table is supported by a knee and saddle, with ample bearing surfaces to give rigidity, and is adjusted vertically by the screw shown. The bearings for the spindle are cast in one piece with the column, which also conduces to rigidity and a strength impossible when the spindle is carried in any movable part. There is practically no overhang of the spindle where the wheel is carried, thus freedom from chatter is insured and also ability to take heavy cuts.

The machine is furnished with or without a drill grinding attachment. The one used is of the New Yankee type, which, without the necessity of preliminary adjustments to bring the drill to proper grinding position, grinds the drill to the correct angle and with the right amount of clearance. The drill grinding capacity can be varied to suit the requirements of any individual shop.

Steel Production in France.—The production of steel ingots in France in the first half of 1909 amounted to 1,506,329 metric tons, as compared with 1,364,979 tons in the corresponding period of 1908. The Meurthe-et-Moselle District leads with 688,236 tons, followed by the North with 372,169 tons. The Center produced 107,935 tons and the Loire 81,077 tons. Only 46,143 tons was acid Bessemer steel. The product of basic Bessemer was 909,995 tons; of open hearth steel, 541,508 tons; of crucible steel, 7973 tons, and of electric steel, 620 tons. The production of finished iron and steel was 1,006,436 tons, which included 182,755 tons of rails, 177,471 tons of plates, 69,669 tons of beams, 140,880 tons of shapes, 251,256 tons of various merchant products, 15,090 tons of tires, 55,820 tons of "machine," 28,887 tons of wire, 17,755 tons of tubes and pipes, 19,184 tons of tin plate, 21,222 tons of forgings and 16,449 tons of steel castings.

The Standard Special Draw Bench.

The machine illustrated is known by its builder, the Standard Machinery Company, Providence, R. I., as the No. 3 special draw bench, designed for drawing steel, copper, brass, gold, silver or aluminum tubing and solid rods, the capacity being solid steel bars to 1 in. in diameter and steel tubing to 2 in. in diameter, at 1-16 in. at a draw. Special features are the parallel wedge tongs and automatic quick return. The tongs slide into a casing consisting of a solid steel forging, machined out. The drive is from a friction pulley; the capacity of the pull is 14,000 lb.

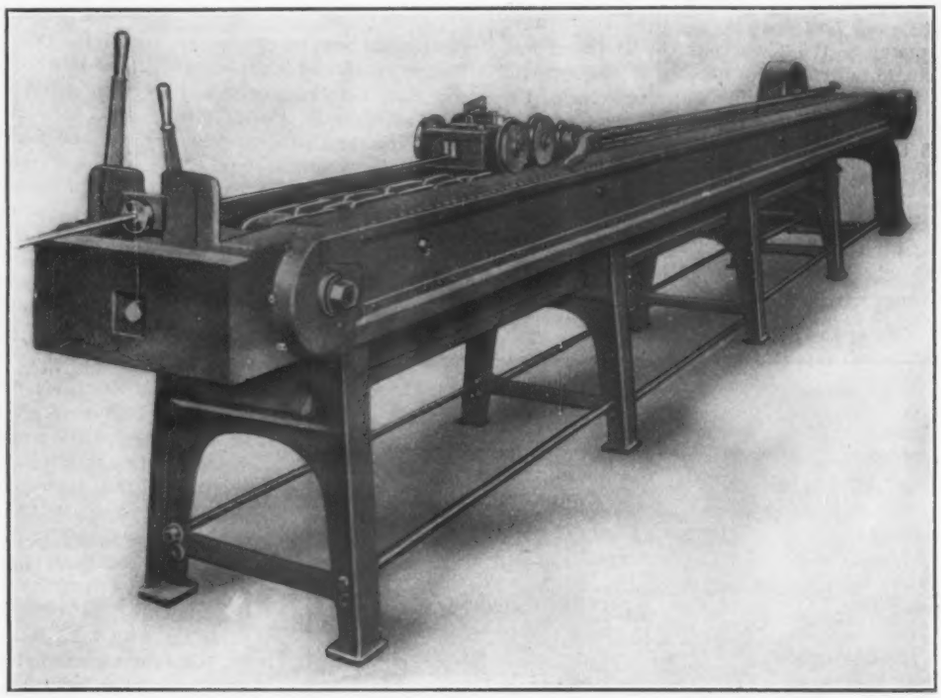


Fig. 1.—The No. 3 Special Draw Bench Built by the Standard Machinery Company, Providence, R. I.

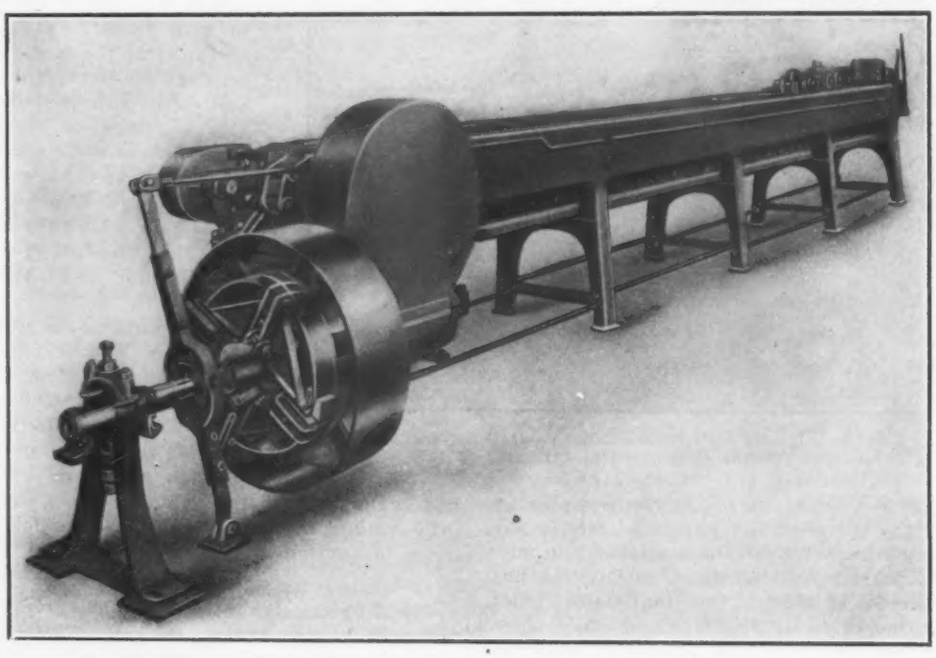


Fig. 2.—Driving End of the Special Draw Bench.

The starting lever is located at the working end of the machine—the right hand one shown in Fig. 1. The driving end is in the foreground in Fig. 2. The tongs, shown in detail in Fig. 3, are fitted with two sets of wheels. The larger ones are used while drawing and the smaller ones for the return. On the shaft of the latter pair is a pawl, which engages the sprocket chain for the quick return. On the opposite side of the tongs is the hook for engaging the heavy chain for the draw.

When the work has been started in the die block the lever at the left of the head, Fig. 1, is thrown to its vertical position, which engages the hook in the drawing chain. At the end of the stroke a dog raises the pair of central rails upon which the return wheels of the tongs travel. This motion disengages the hook and engages the pawl of the quick return. The tongs then travel back to the starting position and the motion is arrested when the pawl rides upon the sprocket wheel guard. The return is geared 2½ to 1, so that with a speed of 50 ft. a minute on the draw a return of 125 ft. is obtained.

The bench is constructed of four channel irons made up in two pairs and fastened together by stiff tie rods. The driving head and legs are of cast iron, while the die head is of malleable iron. The chain consists of hot forged links with extra heavy pins. The drive is from a worm on the clutch shaft to a worm wheel.

The length of drive is 20 ft., the regular length of the bed 21 ft., the distance from the center of the sprocket to the die plate 22 ft. 3 in., the overall length 28 ft., the

diameter of the friction pulley 30 in. and the face 8¼ in., the gear ratio 21 to 1, overall length of the tongs 26½ in., the width across the top of the bench 21 in., the

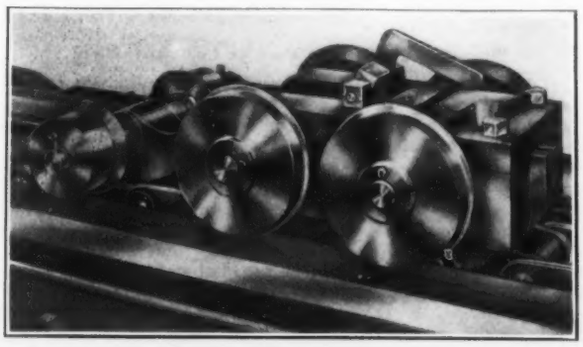


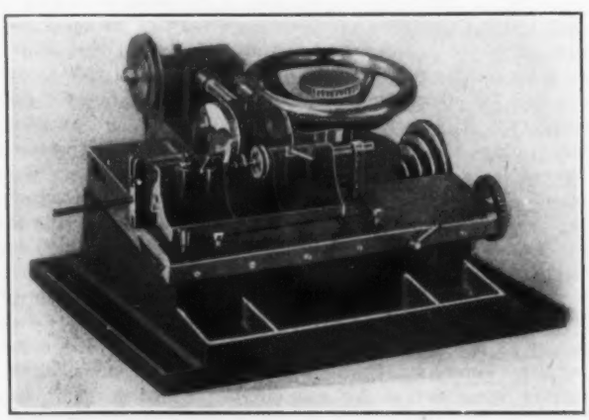
Fig. 3.—Detail of the Tongs.

depth of the channel irons 10 in., the distance between the rollers 10¼ in., the floor space 4 ft. 3 in. by 28 ft., and the weight 8000 lb.

A Waltham Automatic Staff Turning Machine.

The machine illustrated, made by the Waltham Machine works, Waltham, Mass., is designed to turn automatically, with one holding, several shoulders on small work, such as staffs of watches and clocks. It has two slides, one carrying the work supported on dead centers and driven by a dog in contact with a belt-driven plate, and the other, at right angles to the first, carrying the tool or tools. There are two cams mounted on a vertical shaft at the rear, one for each slide, to which they are connected by sliding wedges in contact with hardened rolls on the slides, the contact being maintained by springs. The wedge angles are such that the longitudinal movement of the wedge transmits a reduced slide movement. For watch work the movement of the work slide is made one-quarter and of the tool slide one-eighth of the travel of the wedges. For larger work the reduction is correspondingly smaller. As the cams can be cut with rises several times the required travel, any small inaccuracies will be greatly reduced in the movement, so as not to be noticeable in the work.

The cam shaft is driven through a friction clutch by worm and worm gear. By releasing the clutch the shaft can be turned by a hand wheel, which expedites the setting of tools. The cam form determines whether the tool cuts straight or taper, or part taper and part straight, or all taper at different angles. By means of a screw adjustment on each slide, the diameter of the most particular part and the distance of the most important shoulder from one of the ends can be obtained exactly, which will make all other diameters and lengths exact. Duplicate parts can be turned so long as the tool holds its edge. By turning all shoulders on one end of a staff at one holding, there is a gain in production as compared to turning single shoulders and redogging for each new one, and when cams are correctly cut lengths and angles will always bear correct relation to one another.



An Automatic Machine for Turning Clock and Watch Staffs, Made by the Waltham Machine Works, Waltham, Mass.

The head and tailstock spindles carrying the dead centers can be moved longitudinally in their bearings, and are so designed that if one is in its proper position the other can be withdrawn for changing work by means of the lever at the left of the tailstock. Thus the two ends of a staff may be turned with all the lengths gauged from the same end, which throws all errors of the blank to the extreme of the other end where they can most easily be rectified. The centers are kept in contact with the work by light springs. For watch and other work where the total length of the blanks is less than 0.75 in., the head and tailstock are made in a single casting so that correct alignment is more easily obtained, but for larger and longer work a separate adjustment is provided for on a bed plate. In either case the design permits of slight swiveling with screw adjustment, so that the centers may be brought parallel to the work slide.

A two-tool turret is supplied for use on delicate watch work, in which there is considerable stock, making two cuts desirable. The turret automatically indexes at the completion of each cut. The position of one of the tools is determined by the screw on the slide, while a separate screw adjustment makes it possible to secure a finish cut as coarse or as fine as desired. After the operator has dogged the work and placed it on centers he starts the machine by a foot treadle, whereupon the tool follows the course of the cams, turning, squaring out, &c., until all of the shoulders on one end of the staff have been machined. In a single tool machine the tool then returns to its starting position, the machine stops and the operator inserts a new blank which he has dogged and made ready. With a two-cut machine the turret is indexed on the return, bringing the finishing tool into position. The machine is made for use with either rectangular or circular tools. Arranged for larger work, the capacity between centers is 2.5 in., but the longest total turning is 1.5 in., and the diameter should not exceed 0.5 in. The base of the machine is 15 in. square and the weight from 135 to 140 lb.

The Heroult Furnace in Mexico.—The Mexican Steel & Chemical Company, recently formed for the manufacture of steel, calcium carbide and chemicals in the City of Mexico, will use a Heroult electric furnace for the manufacture of tool and drill steel, shoes and dies, forgings and steel castings, also light steel rails of from 14 to 20 lb. per yard. The capacity of the electric steel furnace will be 16 to 20 tons per day of steel ingots. These will be worked up under the hammer into the different forms of tool and drill steel, shoes and dies, car axles, &c. The company is now erecting a plant for the manufacture of calcium carbide, using a continuous type of furnace. It will have a capacity of from 3000 tons to 5000 tons of carbide per year. Both the carbide furnace and the steel furnace will be of the single-phase type. The carbide furnace is expected to be in operation by the spring of 1910 and the steel plant a few months later. The land purchased consists of about 30 acres within the limits of the City of Mexico. Robert Turnbull, Canadian representative of the Heroult furnace, will design and build the steel plant, and the carbide furnace will be designed and constructed by Charles Bingham of London, England.

The National Fire Protection Association's Committee on Artificial Refrigeration recommends that wherever in any system graphite can be used as a lubricant in compression cylinders it should be done. The committee says: "This especially applies to air compressors used in dense air systems and for air compression for purposes other than refrigeration, as the temperature of the compression cylinders undoubtedly rises in some air systems to a point where inflammable vapors may be generated from lubricating oil."

Electrically Driven Reversing Rolling Mills.

At the meeting of the Iron and Steel Institute, held in the hall of the Institution of Civil Engineers, London, September 28 to October 1, a paper which provoked some discussion was that of C. A. Ablett on "The Determination of the Economy of Reversing Rolling Mills." Mr. Ablett had presented at the Middlesbrough meeting of the Institute one year previous a paper dealing with electric drives in rolling mills, and the more recent paper was designed to give additional information. The author opened with the statement that since the last autumn meeting of the Iron and Steel Institute five steel works had decided to adopt electrically driven reversing rolling mills, making in all over 20 firms that had reached this decision. Twelve such plants are now at work in different parts of the world, one of these having been installed to replace an engine less than 10 years old which was in good condition. Mr. Ablett summarized the reasons for this decision as follows: 1. Greater economy in fuel consumption. 2. Larger output from plant. 3. Reduced running costs, *i. e.*, reduction in cost of repairs, attendance, oil, &c., the reduction in the cost of oil being very striking. 4. Greater convenience and reduction of management expenses due to centralization of power supply. 5. The great economy of the electrical plant is maintained throughout the life of a plant and does not diminish as the parts wear.

A synopsis of the points made in the remainder of the paper is as follows:

The capital cost of an electrically driven reversing mill is greater than that of a steam driven mill driven by a plain two-cylinder engine, but in the last two years the experience gained in setting a number of such plants to work has enabled the capital cost to be very materially reduced. Further reductions in the capital cost are scarcely possible unless some entirely new method of reversing mill driving is evolved in place of the Ilgner system, which has been employed exclusively up to the present, and the present state of electrical knowledge does not offer much prospect of this.

Test for Fuel Consumption.

In a very large number of cases the economies which could be effected by the adoption of electric driving are found amply to justify the increased capital expenditure. At the present time the question of saving in fuel consumption appeals to most steel makers as the chief inducement offered by electrical driving, as the possibilities in the direction of greater output are not fully recognized, there being as yet no published figures relating to this. But, in the author's opinion, the tests frequently made to determine the economy of reversing mill engines do not give as conclusive information as they have been assumed to give. These tests are made either (1) by indicating the engine and estimating the steam consumption per indicated horse-power from some of the larger diagrams or (2) where boilers can be isolated by measuring either the feed water or the coal burned for a considerable period, and keeping a record of the tonnage of steel rolled over that period, so that the result is expressed in pound of coal or pound of steam per ton rolled.

In discussing these tests the author says that it is customary to consider only a few of the larger indicator diagrams, where the engine is working fairly economically. With a blooming mill the ingot is seldom in the rolls for more than one-seventh of the total time taken to roll it down, and if a continuous set of diagrams be taken it will be found that less than one-quarter of these represent anything like the full power of the engine. The steam consumption corresponding to small diagrams is naturally considerably higher per indicated horse-power than that which corresponds to full load, so if the steam consumption was worked out for all the diagrams taken in rolling down an ingot, with a continuous indicator, the average steam consumption per indicated horse-power would be shown to be much higher than if only a few of the larger diagrams were chosen.

The method of measuring the feed water or coal burned per ton of steel rolled, which can only be carried out where it is possible to isolate boilers for the purpose, is open to the objection that two entirely different quantities are included in one measurement, *i. e.*, the economy of the engine, and the actual work done in rolling the steel. This prevents any comparison being made between different engines, unless the same sections are being rolled from the same sized ingots under similar conditions in both cases.

The conclusion from the discussion of the above points is that the tests named do not furnish any clue to the mechanical efficiency of the engine. Taking indicator diagrams when the engine is driving the mill at full speed running light shows the mechanical losses to be considerably less than they really are when ingots are being rolled, and this is particularly the case when the engine is geared to the mill.

Measuring Electric Power Consumption.

The energy consumption of an electrically driven reversing rolling mill as expressed in kilowatt-hours (Board of Trade units) per ton rolled can, however, be determined in the simplest possible manner by inserting an ordinary integrating wattmeter in the supply system, which is an instrument that can always be left in circuit and requires no attention. If a reading of this instrument before the commencement of a shift and a second reading at the end of the shift are taken, the difference gives the total kilowatt-hours used during the shift, and dividing this by the tonnage rolled the total kilowatt-hours per ton is obtained. Such readings can quite easily be taken for every shift, and a continuous check on the energy consumption can be kept. Results expressed in kilowatt-hours per ton are generally found most useful as the cost of the kilowatt-hour varies according to local conditions, and knowing this cost, the total cost of power can be arrived at directly. The efficiency of the electrical plant can also be checked in the simplest possible manner by placing a second integrating wattmeter in the armature circuit of the mill motor.

The records of this wattmeter will be less than those of the one placed in the supply circuit, the difference being the losses in the electrical plant. This does not take account of the efficiency of the mill motor armateur, but as this is of the order of 97 to 98 per cent. it can well be neglected. The following figures show some characteristic values for the kilowatt-hours per ton rolled obtained from tests on reversing mills:

	Kilowatt-hours per ton.
4½ x 4½ in. billets from 2.5-ton ingots. Output, 63 tons per hour	22.5
6 x 6 in. blooms from 2.5-ton ingots. Output, 63 tons per hour	17.5
8 x 8 in. blooms from 2.5-ton ingots. Output, 80 tons per hour	13.0
12 x 9½ in. blooms from 7-ton ingots measuring 34½ x 25 in. Output, 65 tons per hour	11.2
32 x 9 in. slabs from 6-ton ingots measuring 36 x 19½ in. Output, 40 tons per hour	4.3
32 x 5 in. slabs from 6-ton ingots measuring 36 x 19½ in. Output, 40 tons per hour	5.8
Flange rails, 100 lb. per yard, from 2-ton ingots. Output, 30 tons per hour	48.0
Beams, 120 lb. per yard, from 1.5-ton ingots	36.0
Channels, 92 lb. per yard, from 1.5-ton ingots	37.0

Discussion.

Andrew Lamberton, in opening the discussion, said that the title of the paper and the statement of five claims at the beginning would lead to the inference that the author proposed to show that electrical driving of reversing rolling mills results in great economy. He had not found in the paper a single figure to substantiate such claims. At the end of the paper a statement was given of the consumption in kilowatt hours for rolling certain sections, and Mr. Ablett had given results in that form in his previous paper. What the steelmaker wanted to know was the £ s. d., and this was not entirely made up of the kilowatts multiplied by the cost of the unit. No data were supplied of the first costs of steam and electric plant and of interest and depreciation. Nothing was given to substantiate the statement in the paper that electrical plant gives a reduction in the cost of repairs. As high an authority as Michael Longridge had stated that the maintenance of motors costs twice as much as that of steam engines, and it was a fact that the insurance premiums for motors and dynamos are twice those charged for steam engines. The usual allowance for depreciation of electrical machinery is 15 per cent. and for steam plant 10 per cent. If there is any mistake in these figures it is that 15 per cent. is too low for electrical plant. The speaker cited the comments of A. Greiner in the discussion at Middlesbrough last year, referring to experience with the electrically driven reversing mill in Germany. With coal at prices then prevailing, which were higher in Germany than in Great Britain, and allowing 15 per cent. for depreciation, electric rolling was nearly as cheap as rolling by steam plant. In that comparison, however, it was pointed out that the electric motors were driven by gas engines running on waste gases, so that the cost of electrical drive would be much higher where coal had to be employed. The advocates of

electric drive, he said, had not yet met that statement.

Mr. Greiner had said that a ton of steel could be rolled by steam power for less than sixpence per ton, and that with an electrically driven reversing mill the cost would be greater, the amount depending on local conditions. Mr. Lamberton had himself made a calculation. It showed that the cost by steam including interest, 10 per cent. depreciation, and assuming an output of 300 tons in 10 hours was sixpence per ton. Driving the same mills with current generated by gas plant with all accessories, including interest and 15 per cent. depreciation, would show 8.8 pence per ton. In the one case coal for raising steam was figured at 6 shillings per ton; the figures for electrical drive included nothing for actual cost of fuel.

Mr. Lamberton referred again to a new method of driving, to take the place of the Ilgner system, which he had suggested at the Middlesbrough discussion of the same subject. Mr. Ablett had stated that further reductions in the capital cost of electrically driven mills was scarcely possible unless a new method of driving could be devised to take the place of the Ilgner system. Mr. Lamberton's proposal was to substitute for the Ilgner arrangement a clutch reversing mill, at least in smaller plants. The objections to such mills had been that they were very noisy and very destructive of the clutches. As an improvement a friction clutch of the coil type could be used simply for starting the mill easily and without stop. When the speed was accelerated to within 5 per cent. of the normal speed of the mill, the positive clutch could be automatically put in, taking the whole load of rolling and entirely relieving the friction clutch of stress. On reversal the action was the converse of the above. For mills up to 30 in. in diameter the speaker thought that such an arrangement would be advantageous.

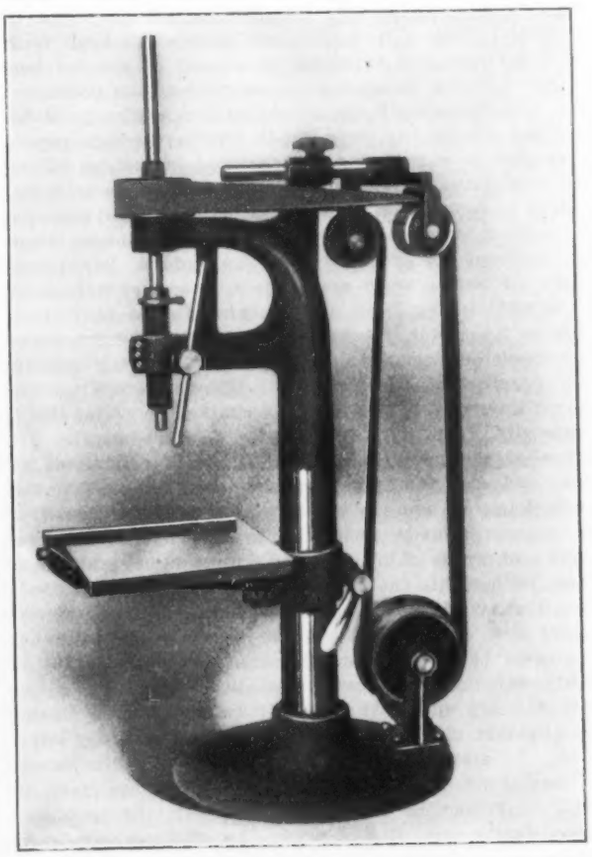
Lord Airedale considered that the figures given by Mr. Lamberton had not disposed of the electric drive. Where rolling is intermittent he could see a great advantage in an electrically driven mill if power were taken from a central source and not paid for when not required.

Alex. Siemens, referring to his 20 years' experience with a 1000-kw. generating plant, said that the cost, including depreciation, repairs and all possible charges, figured out .25d. per kilowatt hour. Thus, all that is necessary is to divide the figures given at the end of the paper by four with such a cost to get the result in £ s. d. for rolling. In the matter of the keeping up of electrical machinery the point was overlooked, he said, that it is cheaper to employ a large motor rather than a small one. Complaint had been made at times of excessive current consumption; in one such case, where a motor of double the size had been put in, the current consumption was cut in two. A motor too small for the work consumes current in heating and in other ways. He considered a depreciation of 15 per cent. too high where the system is properly designed. His objection to Mr. Lamberton's clutch method was that it would wear out under the shocks of a rolling mill, and right there was the advantage of the electrical system, the shocks not being mechanical.

Mr. Ablett said that his paper was not designed so much to prove the economy of the electrically driven mill as to show the steelmaker how to make proper tests of the system. A new mill was set to work at the Rheinische Stahlwerke last year. It was found that with steam driving the blooming mill was not able to cope with the work. That was the mill he referred to as being only 10 years old. The intention was to put down a second mill, but the electrical engineer promised 30 per cent. more output, and an electrically driven mill was installed. The promise made of 30 per cent. more output had been carried out. The mill had been running continuously since September 4, 1908, and had effected a considerable saving in the rolling costs—on an output of 5000 tons per week. The oil consumption had also been materially reduced. Since that mill had been set to work three other large steel works in the neighborhood had placed contracts for electrically driven reversing mills. With regard to depreciation, he referred to the plant of the Niagara Falls Power Company, where a 5000-hp. generator plant was put in service 14 years ago. When, after 10 years running, it was found necessary to rewind the machines the cost was comparatively small. After rewinding there was no reason why the machines should not run for another 10 years. In his opinion 15 per cent. depreciation on electrical plant was too high a figure.

The Rockford 10-In. Bench Drill.

A new 10-in. sensitive bench drill press made by the Rockford Lathe & Drill Company, Rockford, Ill., formerly the Rockford Machine & Shuttle Company, is shown in the accompanying engraving. The feature of this drill is that the countershaft can be placed either on the wall or the ceiling. The driving cone pulley is placed at the base of the machine, where it is least likely to produce vibration. The two idler pulleys are supported on a bracket which is adjustable for tightening the belt. The table can be swung around the column and tilted to any position. A supporting bracket is provided on the table



A 10-In. Sensitive Bench Drill Made by the Rockford Lathe & Drill Company, Rockford, Ill.

for holding the work when drilling holes at an angle and a gauge for drilling holes in round pieces. This bracket will prevent the work drilled from revolving.

The spindle is ¾ in. in diameter and 17 in. long. Through the lever the spindle may be fed a distance of 3 in. The table, which has an 8 x 8 in. top, has a vertical adjustment of 9 in. The greatest distance from the spindle to the table is 12 in. The countershaft pulleys are 5 in. in diameter by 1⅝ in. face, and run at a speed of 550 rev. per min. The weight of the machine with the countershaft is 112 lb.

The Detroit Pressed Steel Company, Detroit, Mich., recently organized, will manufacture dies, special tools and automobile frames. The company has secured and equipped a building to do a general stamping and tool business, but for the present will specialize in high grade automobile frames and parts. Alfen H. Zacharias is president and general manager; Rudolph F. Flintermann, vice-president; Edward B. Caulkins, secretary; Hobart B. Hoyt, treasurer.

New Publications.

Handbook for Field Geologists. By C. W. Hayes, Chief Geologist United States Geological Survey. Morocco bound, 16 mo.; ix + 159 pages. Published by John Wiley & Sons, New York. Price, $1.50 net.

In the first place a handbook for field geologists in the United States Geological Survey was brought out in 1908. It was intended only for distribution to members of the survey. The request for it outside of the survey was such as to lead to the preparation of the present work. This covers the same ground, but omits instructions applying only to members of the Government survey and enlarges upon features of service to students preparing for work in field geology.

Efficiency as a Basis for Operation and Wages. By Harrington Emerson. Cloth bound, 5 x 7½ in. Pages 171. Published by the *Engineering Magazine*, New York. Price, $2.

Mr. Emerson contributed a series of articles under the title of this book to the *Engineering Magazine* in 1908 and 1909. These are now reissued in book form with revision and enlargement as one of the volumes of the "Works Management Library" of the publisher. Mr. Emerson's work in increasing the efficiency of industrial plants has been made known through papers presented to engineering societies and in articles in the technical press. The author's wage system has been discussed in comparison with others better known, perhaps, all aiming at greater output, with special compensation for performance exceeding the set standard. Mr. Emerson's methods pertain not alone to wages, but broadly to manufacturing in all departments. In the early chapters he points out typical inefficiencies in production and discusses the strength and weakness of existing systems of organization. Five general chapters covering the above ground are followed by a chapter on "The Realization of Standards in Practice." Some details are given of the method employed in standardizing as to time and cost, the tasks in a shop employing 2000 men, each doing an average of four different jobs each day. A diagram is made illustrating graphically the effect on costs and profits of an increased output due to staff stimulus and bonus to the line. In the chapter on "The Modern Theory of Cost Accounting" the author differentiates cost accounting from the work of the efficiency engineer, which is to establish standards, ascertain current efficiency and provide remedies which will bring low efficiency up to 100 per cent. Emphasis is put on the co-operation of the comptroller and the efficiency engineer. In another chapter the location and elimination of wastes are discussed, and some examples are given of wide variations in costs in different establishments engaged in the same line of work. An efficiency system in operation is described in another chapter, and then in order "Standard Times and Bonuses" and "What the Efficiency System May Accomplish."

A Study of the Open Hearth.—Pages 91, 5 x 8 in.; flexible leather binding. Published by the Harbison-Walker Refractories Company, Pittsburgh, Pa. For sale by R. S. Davis & Co., Pittsburgh. Price $1.

This is a unique book. The editor's name is not given, but the company which appears as published is sponsor. One is inclined to look for definite statements of an advertising character, but there are none. The readily understandable language, the mechanism and the metallurgy of the open hearth steel processes are explained, apparently the only relation of the undertaking to the business of manufacturing and selling refractories being stated in the preface. It is there said that the study of open hearth steel furnaces was made in the first instance for the operating department of the company. It was appreciated that only by understanding all the conditions encountered in practice could refractories for open hearth furnaces be so manufactured as to maintain the highest standards for such work, and the publication in the present form was at the suggestion of a number of superintendents of open hearth plants. While no new ground is traversed in the little book and no originality is claimed for it, there is distinct merit in its clear and comprehensive handling of the subject. No doubt is left of the thorough acquaintance of the author with the construction and operation of open hearth plants and with the chemistry and metallurgy of open hearth steel. Perhaps the Talbot, duplex, Monell and Bertrand-Thiel modifications might have been treated with a little more fullness. It is noticed, moreover, that some details of editing and typography might have had sharper attention. For example, nothing is said of phosphorus; it is always "phosphorous."

The publishers promise similar books on the blast furnace, hot blast stoves and heating and puddling furnaces. The series represents the development of an excellent idea on which the publishers are to be congratulated.

Laboratory Notes on Iron and Steel Analyses. By Walter Macfarlane. Cloth bound; pages xvi + 462, 5 x 7½ in.; illustrations, 25. Published by Longmans, Green & Co., New York and London. Price, $2.50 net.

The author, who is the principal of the metallurgical department Staffordshire Education Committee, in England, and has given instruction in chemistry and metallurgy in Anderson's College and the Glasgow Technical College, prepared these notes originally for the guidance of the staff in an iron and steel works laboratory under his supervision. The accuracy of the methods given was tested in daily practice and confirmed by analysts acting on behalf of buyers and sellers in Great Britain and on the Continent. In their present elaborate form they are offered for the use of metallurgical students, engineers, iron and steel works, chemists, foundrymen, and others. The contents are arranged under the following general headings: Analysis of Steel, Analysis of Pig Iron, Analysis of Iron Ores, Analysis of Blast Furnace Slags, Limestone, &c., Miscellaneous Estimations, Blast Furnace Calculations, and General Notes on Laboratory Operations and Appliances. In a supplement liberal extracts are made from the booklet on the "Commercial Analysis of Iron Ores of the United States Steel Corporation," prepared by J. M. Camp, chairman of the Chemists' Committee of the Steel Corporation subsidiaries. It might have been well had more American methods in other departments of iron and steel works laboratory practice been reproduced. As foundrymen are referred to in the preface as desiring in increasing numbers to have an acquaintance with analytical methods, we might have expected some data on the making of cupola mixtures on the basis of chemical analysis. A chapter is devoted to calculations of yield of ores, quantities required, &c., for burdening the blast furnace.

The Law of Advertising and Sales. By Clowry Chapman, contributor to the American and English Encyclopedia of Law. 2 vols; total, 685 pages. For sale by Clowry Chapman, 282 Manhattan Avenue, New York. Price, $10.

The information collected in these two volumes covers matter previously scattered through thousands of reports of cases in the highest courts, besides statutes, proclamations, treatises and ordinances contained in hundreds of other volumes. Exhaustive information is thus given relative to rights of individuals and the legal method of practice in regard to a great variety of transactions not usually covered in books of reference intended for business men. The contents are treated in 81 chapters, and a comprehensive index is provided. The work covers 5,000 points relating to trademarks, copyright, labels, packages, secret processes, patents, good will, regulation of prices, contracts, postal laws, &c. As indicating the character of the contents, one chapter may be referred to which is headed "Space and Copy." This chapter takes up such subjects as the obligation to accept advertising without discrimination; the space owner's liability to the advertiser for negligence; the liability to the reader; the fact that the rates may be withdrawn before the contract is consummated; how advertising terms are to be construed; the meaning of certain terms as used in advertising agreements, &c. Many other chapters are given which will be found of interest to those who

conduct extensive advertising campaigns. Speaking generally, the information given will be found of great value to all who conduct commercial transactions.

Aluminum-Copper-Tin and Copper-Zinc Alloys.

At the autumn conference of the Institute of Metals at Manchester, England, October 14 and 15, two interesting papers on alloys were presented. The first was by C. A. Edwards and J. H. Andrew, dealing with the constitution and properties of the aluminum-copper-tin alloys. The authors said that of the constitution of alloys containing more than two elements little is known, and it cannot be said that the ternary alloys now in use are the best mixtures of their components. Aluminum, copper and tin were chosen for consideration, since the constitutions of the three series, aluminum-copper, aluminum-tin and copper-tin have been investigated and, further, because it is desired to substitute aluminum for tin in brasses and other industrial alloys. It is desired also to learn what effect a third metal has on the transformations of such complicated alloys as the aluminum-copper and copper-tin series. Judging from the constitution and general appearance of the alloys, it is quite obvious that those possessing reasonable mechanical properties are confined to two very limited areas. The most important alloys of copper-tin are those containing from 9 to 14 per cent. of tin. The question arises whether some of this tin can be replaced by the cheaper metal, aluminum. The ultimate stress of the two alloys is almost the same, but the ductility of the aluminum-copper alloys is far superior to the copper-tin; therefore it is reasonable to expect that the substitution of aluminum for tin within certain limits would tend to improve the properties of the alloys. An alloy containing about 6.5 per cent. of aluminum and 5.5 per cent. of tin by weight would have the same properties as an alloy containing 10 per cent. of tin and 90 per cent. of copper. Such a ternary alloy would be cheaper than the copper-tin and would also have a lower specific gravity.

Dr. H. C. H. Carpenter referred to the enormous amount of work involved in the paper. In connection with one diagram alone more than 450 alloys had to be made. While it is disappointing to learn that the commercial possibilities of these alloys are confined to so small a number, at least the establishment of that fact will prove very useful, as attention will be concentrated on those alloys shown to be capable of industrial application. Of special interest is the fact brought out as to the insolubility of tin in very many alloys. To the speaker the research indicated the possibility, at the present price of aluminum, of using it to extract tin from tin residues which at present are not worth working to an extent, making the operation commercial.

J. Brentnall said that in making manganese bronze castings one great difficulty is to prevent their leaking under pressure. He had carried on some work on aluminum-tin alloys beginning with about equal percentages. He found that when copper was added corrosive action was diminished, until with about 10 per cent. of copper it was hardly noticeable. With a greater percentage of copper the action was not so much checked. On the other hand adding zinc to an alloy of tin and aluminum increases the corrosive action very greatly. With 95 per cent. zinc and 5 per cent. tin and aluminum the action proved so great that gas collected at the rate of 250 c. m. in a half hour.

Alloys of Copper and Zinc.

The second paper, which was by Prof. T. Turner and M. T. Murray, referred at the outset to the changes in volume occurring when metals pass from the fluid state to the temperature of the air. It has been shown that cast iron has three definite expansions in cooling, these corresponding to particular temperatures and to the separation of certain ingredients. These experiments have been extended in the past year at the University of Birmingham to brasses, which are the alloys of first importance industrially. The fact heretofore unrecorded was brought out in these investigations, that with certain percentages of zinc and copper, the metal, when poured into the mold, does not immediately begin to contract owing to the cooling, but for a short time actually expands. One alloy, with about 15 per cent of copper, expanded in a most remarkable manner, and after the metal had finally cooled and shrunk in the mold the bar remained as long as the pattern from which it was cast. It was curious to note that some of the alloys in the series did not expand at all when solidifying, these being the brass with 60 per cent. of copper known as Muntz metal, and that with 40 per cent. of copper, which was a hard, white, brittle alloy and probably a definite chemical compound. The hardness of the alloys was determined. It was found that the 40 per cent. alloy is the hardest of the series, being actually much harder than mild steel. The experiments are likely to have an important bearing, practical as well as theoretical, as it is believed that expansometer tests can be more largely used in the future as an aid to the determination of the constitution of all alloys.

In the discussion attention was called to the interesting fact of the agreement shown, in the hardness tests of brasses, between the Brinell and the scleroscope tests. It was pointed out by one speaker that it should have been noted that these only hold for cast alloys and are not applicable to rolled, forged or worked material. With rolled material the hardness, as shown by the scleroscope, increases more rapidly than with the Brinell hardness number. Another speaker failed to find any proof in the paper that a true expansion of volume occurred on the passage of these alloys from the liquid to the solid state; indeed, there are not wanting evidences that contraction takes place. The apparent expansion was, he suggested, due to the thrust exercised during the growth of crystals. The point is one of scientific interest, as, of course, it does not matter from the practical brassfounder's point of view, whether it is a true expansion or a mechanical action. The expansion of bismuth on solidification, he added, has been firmly established. The point was made in a communication by Dr. Walter Rosenhain, Teddington, England, that while data of observed expansions appear to rest on a satisfactory foundation, the negative results contained in the paper—as regards the nonexpansion of certain metals and the noncontraction of others—appear to require confirmation by other methods. The most interesting portion of the paper, he thought, deals with actual observed expansions, so that the correlation of the expansion with the equilibrium curves of the brasses remains as a most valuable forward step in knowledge of alloys. Although unable to accept the data as final, he felt that metallurgists are under a very considerable obligation to Professor Turner for thus breaking new ground.

Dunbar Furnace Improvements.—The Dunbar Furnace Company has completed the rebuilding of its No. 1 furnace, at Dunbar, Pa., and it is expected to make in a short time about 300 tons of pig iron a day. A new blowing engine has been ordered from the Mesta Machine Company, Pittsburgh, which will be installed shortly. Some further improvements to the stack will be made when this engine is installed, consisting of new air lines and cold blast lines. The No. 2 furnace, which was blown in in November, 1906, has been making a good record. Up to October 13 it had made 226,756 tons of pig iron. As this stack is still in good shape, it is the expectation that it can be operated steadily for another year at least. The company has also installed a large sand dryer with a capacity of 30 tons an hour, and dry sand is being shipped as fast as made.

Volume V, which gives the Proceedings of the Fifth Annual Convention of the National Association of Cement Users, held at Cleveland, Ohio, January 11 to 16, 1909, has been received. It is a volume of over 650 pages. The character of the papers and discussions is such as to make this book a most important contribution to cement literature. It is profusely illustrated. The headquarters of the association are in the Harrison Building, Philadelphia, Pa.

The Wheeler Rain-Type Jet Condenser.

Surface condensers have been so improved in recent years that where a heat transmission of 200 or 300 B. t. u. per square foot of surface per hour per degree average difference of temperature was formerly considered acceptable, condensers are now built in which the rate of transmission has been raised to 500 B.t.u. and even more. As a result with the same amount and temperature of circulating water correspondingly less condenser tube surface will be required, or with the same surface less or not so cold circulating water to maintain the same vacuum.

With the jet condenser it is not so much a question of improving the rate of heat transmission as of insuring thoroughness of intermixture—that is, of bringing each particle of water so intimately in contact with the steam that it will be heated to the steam temperature and its full capacity for absorbing heat realized. Thereby the amount of circulating water to be pumped and the power consumed in pumping it is minimized, and the water from the hot well is more suitable for boiler feeding, for the hotter the water from the hot well the less will be the steam required in the feed water heater, or the less the coal required under the boiler, if no heater can be used.

Complete utilization of the heat absorbing capacity of the water between the temperature at which it is received by the condenser and the temperature corresponding to the vacuum is also to be desired where cooling towers are employed in order that a high vacuum may be realized from comparatively warm circulating water, and, further, in order that the water may be delivered to the tower as hot as possible, enabling the latter to get rid of the largest possible amount of heat from a given amount of evaporating surface. Where a condenser is operated in connection with a cooling tower the heat of the steam is transmitted to its final destination, the atmosphere, by two temperature steps, and if the condenser requires a high temperature head to perform its work, the less temperature head will there be available for the tower, which will need to be larger in consequence to transmit the given amount of heat. If it is a plant already installed—that is, if the amount of tower cooling surface is fixed—it may be necessary to provide required temperature gradient by raising the upper limit—that is, by having hotter steam in the condenser—which means lower vacuum.

A further reason why the design of a jet condenser should be such that it is not necessary to circulate an excess of water over the theoretical amount to condense the steam at any stated temperature and pressure is that even though plenty of cold water be available, so that it is not necessary to work close to the temperature limit, the less water used the less will be the amount of air brought in by it to be pumped out again by the air pump. Indeed, with many jet condensers it is found that the vacuum cannot be improved by increasing the amount of circulating water beyond a certain point, because much of the additional water does not come into contact with the steam, and the air introduced with the extra water more than counterbalances any benefit gained by lower average temperature of the water.

At first it would seem easier and simpler to secure high temperature in the circulating water leaving a jet condenser than in that leaving a surface condenser, since in the former the water and steam come into actual immediate contract. Nevertheless, the water discharged from most jet condensers does not rise nearer than to within 10 to 20 degrees F. of the temperature of the steam. This failure to realize the fullest economy of injection water, power, heat and the high vacuum that would naturally be expected from the jet condenser is due to several causes, among them faulty design of the condenser head, resulting in insufficient subdivision of the steam and water, so that some masses of water pass through without having come in contact with steam; bad arrangement as in some jet and ejector condensers where the steam projects itself against the water at high velocity, which high velocity necessarily means back pressure on the engine or turbine; lack of adequate provision for withdrawing air, including not only air introduced with the steam, but also that carried in solution in circulating water; lack of adequate provision for cooling the air before it passes to the air pump, and where air pumps are used, improper arrangement of parts, so that the air pump may receive steam rather than air from the condenser chamber.

A new form of jet condenser recently installed in the power house of an electric railway company, is shown in Fig. 1. This outfit, furnished entire by the Wheeler Condenser & Engineering Company, Carteret, N. J., is installed in the basement beneath a Westinghouse-Parsons 1000-kw. steam turbine. The injection water is taken from a creek nearby, and the warm water is pumped from the condenser head by a centrifugal pump, driven by a vertical engine. Air is withdrawn by a rotative dry vacuum pump, while a horizontal relief valve provides outlet to the atmosphere in case of stoppage of circulating water.

The salient features of this condenser are revealed in

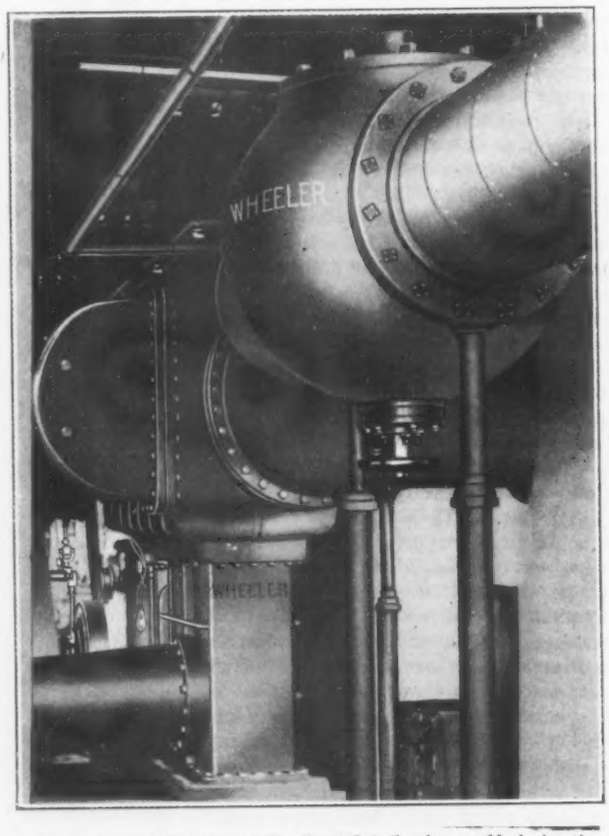


Fig. 1.—An Installation of the New Jet Condenser Made by the Wheeler Condenser & Engineering Company, Carteret, N. J.

the sectional view, Fig. 2, which, however, does not show the exact type of hot-well installed at the above plant. The condenser head, however, is identical. Referring to the drawing, the water is introduced in the upper right hand corner into an extended trough or pan, from which it overflows through numerous short tubes, also at the edge on the extreme left, falling into a second and similar pan provided with similar overflow pipes and weir, and finally falling into the lower part of the shell, and flowing thence to the barometric column or to the centrifugal or other type of pump serving to overcome the atmospheric pressure. The steam enters through the opening at the left, passes horizontally across through the shower of water, ascends to the second level, passes to the left through the upper shower, and finally all that is left of the steam vapor, together with the air and other gases, passes horizontally to the right, and over the entering and coldest water at the top to the dry vacuum pump suction, opening in the upper part of the shell. It will be noticed that the cross section of the passage traversed by the steam continuously diminishes as the volume of steam is reduced by condensation, and that, therefore, a uniform steady velocity is maintained throughout, leaving no dead pockets in which air

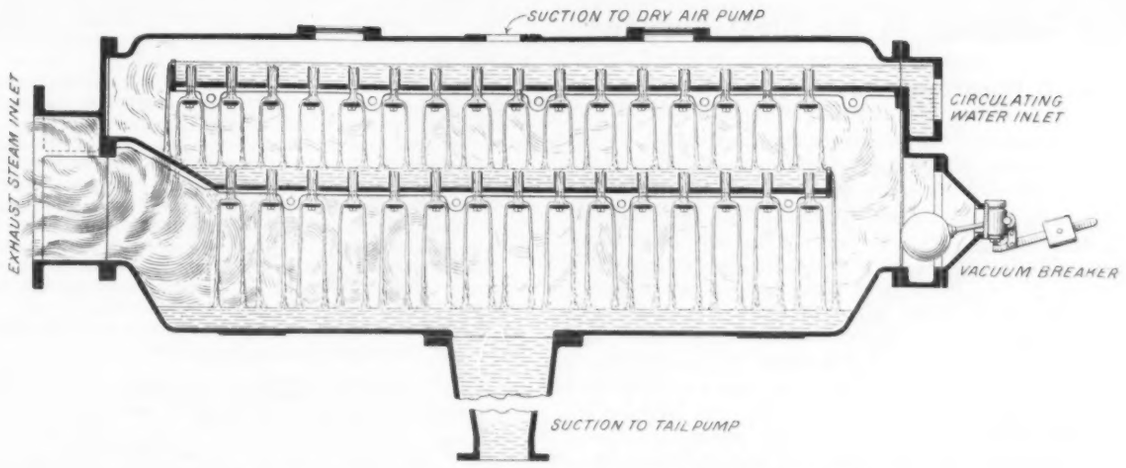


Fig. 2.—Longitudinal Section of the Wheeler Rain-Type Jet Condenser.

might accumulate. Air is nearly twice as heavy as the same volume of steam at the same temperature, and, unless swept forward, positively will collect in the lowest part of the condenser shell. In surface condensers it is allowable to place the air pump suction at a low point, but not in jet condensers because of the possibility of water being carried over. To lessen the size, and work of the air pump, it is also important that the air, at the last moment, may be in contact with the coldest water.

From the drawing it will be seen that it is impossible for any of the steam to pass to the air pump suction without having traversed all of the sprays. The water is finely divided by the small baffles hung below the tubes. In some of the older types of direct contact condensers, the condenser cone was substantially an open chamber in which the hot steam would naturally rise to the top, while the air would fall to the bottom, the very opposite of the condition sought, for if the air pump receives steam rather than air all its work is for nothing, while the air keeps on accumulating until the vacuum is seriously impaired.

At the right of the drawing will be seen a float controlling a vacuum breaking valve. If the water level should rise abnormally in the shell, due possibly to stoppage of the circulating pump, this will break the vacuum, whereupon the inflow of water will cease, since the circulating water is syphoned up to the condenser head from a lower level. The steam would, thereupon, escape through the relief valve.

Tests made on this condenser in actual service show that the innovations introduced have worked to good advantage. On the day of the test the barometer stood at 29.9 in., while the street railway load on the turbine varied from full load to 10 per cent. overload. Temperature readings were taken by thermometers placed in the exhaust pipe and in the hot well, while the vacuum readings were taken from a mercury column connected to the condenser.

Results of Tests of Wheeler Rectangular Rain Type Jet Condenser.

Vacuum. Inches.	Absolute pressure. In. mer.	Corresponding temp of exh. steam. Degrees.	Injection water temp. Degrees. In.	Out.	Difference in temp. between steam and cir. water. Degrees.
28.65	1.25	85.5	44	85	0.5
28.7	1.2	85	44	85	0.0
28.75	1.15	85.5	44	83	0.5
28.7	1.2	85	44	83	2.0
28.75	1.15	83.5	44	80	3.5
28.75	1.15	83.5	44	81	2.5
28.65	1.25	85.7	44	80	5.5
28.55	1.35	88.5	44	87	1.5
28.75	1.15	83.5	42	79	4.5
28.75	1.15	83.5	42	76	7.5
28.6	1.3	87	43	82	5.0
28.6	1.3	87	43	82	5.0
28.7	1.2	85	43	82	3.0
28.65	1.25	85.5	43.5	82	3.5
28.75	1.15	83.5	43.5	83	0.5

Although due to the widely varying load on the turbine, it was necessary to set the injection valve to care for the maximum load likely to be carried, it will be noticed that the temperature of the tail water was kept very close to the temperature of the exhaust steam, although due to the coldness of the condensing water available the rise in temperature of the injection water was quite large, and only a comparatively small amount of water was required, a condition unfavorable to close adjustment.

It may be of interest to calculate approximately the ratio of steam condensed to circulating water used. In the eighth set of readings is found a vacuum of 28.55 in. of mercury. Subtracting this from 29.9, the barometric reading, leaves 1.35 in. of mercury steam pressure. According to Peabody's tables, this corresponds to a temperature of 88.5 degrees F., although the reading of the thermometer in the steam space at the same instant was 90 degrees F. The latent heat of steam at 88.5 is 1042 B.t.u. Too cool the condensate from 88.5 to 87 degrees F., the temperature of the outgoing condensate, will give 1.5 heat units, or 1043.5 in all. The entering temperature of the circulating water is given as 44 degrees F. and the final temperature is 87 degrees F., between which limits each pound of water will absorb 43 heat units. Dividing 1043.5 by 43 gives 24.3 as the number of pounds of circulating water required to condense 1 lb. of steam. As a matter of fact, the amount would be less than this, since not all of the exhaust is steam when it arrives at the condenser, some of it having already condensed in the turbine and in the exhaust pipe, due to work performed and to radiation. Suppose that 10 per cent. of the steam is water—that is, that the quality of the exhaust is 0.90. Taking 90 per cent. of 1042, or 940, and adding 1.5 gives 941.5, and dividing by 43 gives 21.9 as the ratio of the circulating water to steam.

The Youngstown Foundry & Machine Company, Youngstown, Ohio, has discontinued the manufacture of steel castings at its East Boardman street works and has torn out its open hearth furnace and is installing one 25-ton and one 15-ton air furnace for the manufacture of sand, chilled and semisteel rolls exclusively. There was no worn out material to take out, but the company is simply changing the plant over from a steel foundry to a foundry for the manufacture of rolls exclusively. It will install about six roll lathes of its own manufacture and will continue the manufacture of castings of all descriptions, as well as rolling mill machinery, at its Reserve street works in Youngstown. The new roll plant is expected to be ready in the latter part of December.

For the first time since the strike started, on July 1 last, all of the 20 hot tin mills in the New Castle Works of the American Sheet & Tin Plate Company, at New Castle, Pa., are in full operation. The Humbert Works of this company, at South Connellsville, Pa., containing six hot tin mills, which has been idle since June, 1905, is being prepared for operation and will be started full on the open shop plan as soon as the necessary repairs and improvements can be made.

Fuel Economy in the Blast Furnace.

No More Important Savings to Be Expected.

N. M. Langdon, Mancelona, Mich., contributed for the recent Spokane meeting of the American Institute of Mining Engineers an important paper dealing with fuel economy in the iron blast furnace, with special reference to the use of the dry blast. The question is raised at the outset whether in considering the saving of 20 per cent. of fuel per ton of iron, made possible by the Gayley dry blast, there is a still further economy that may be reached and, if so, how it is to be attained. The manner in which the heat generated in the furnace is utilized in the production of pig iron may be determined by the method of Bell and Gruner for any furnace for which the necessary data have been obtained, and the author suggests that the study of the operation of a number of furnaces under various conditions should permit of some conclusions on the subject.

The paper, which covers 22 printed pages, gives a number of tables and conclusions covering the operations of certain blast furnaces heretofore reported in the *Transactions* of the Institute; also of the two Isabella furnaces using natural and dry blast in Mr. Gayley's experiments, and in addition the operations of various hypothetical furnaces. The furnaces for which actual data are given, in addition to the two Isabella, are the following: Clarence Furnace of Bell Brothers, Middlesbrough, England; the Illinois Steel Company's Union Furnace No. 2, Sharon Furnace No. 2, Alice Furnace, at Sharpsville, Pa., and the Antrim Furnace, at Mancelona, Mich. The hypothetical furnaces added to the above give 25 different calculations. There are five tables. Table 1 gives data supplied, calculated or assumed for the furnaces named as to capacity, output, materials, temperatures, moisture, &c. Table 2 gives the stock equation of materials received into and discharged from the furnaces. Table 3 shows the heat equation for each furnace. All the heat generated in the furnace by the combustion of the fuel or taken in with the blast is fully accounted for and evenly balanced by the heat consumed in the transformation of the materials or lost by conduction and radiation. Table 4 gives data of operation, efficiency, &c., calculated for the furnaces named. Table 5 is a comparison of one Isabella furnace with dry blast and one with natural blast, for which the author employs his own factors in figuring the heat units.

Theories of the Economy of the Dry Blast.

The theories advanced for the actual saving of 20 per cent. in fuel (even though the saving in heat requirements for the decomposition of moisture in the blast is much less) are thus reviewed by the author:

Three theories have been advanced, either of which apparently accounts for the saving: "Additional uniformity obtained by the use of dry air," first advanced by James Gayley, and later emphasized by Dr. R. W. Raymond and others; "critical temperature," advanced by J. E. Johnson and supported by Prof. H. M. Howe; "more oxygen per day and increased reducing power and smelting-down capacity," advanced by Prof. J. W. Richards. To these I will add another and very simple reason—namely, that there is less work to be done in the furnace using dry air, and that, as a natural consequence, less fuel is required to do it.

Have those who advance the "uniformity" theory mistaken the shadow for the substance? Applied to the operation of the blast furnace, uniformity is descriptive of a condition and is not itself a condition. Applied to the moisture of the blast, it is descriptive of its quantity. Taken in this connection, it also means uniformly low quantity of moisture. In accounting for the saving of fuel with dry, as compared to natural blast, by the more uniform condition of the moisture of the blast, it is apparent that the full meaning of the term has been lost sight of. There is not the least doubt that uniformity in the moisture of the blast contributes largely to uniformity in the working of the furnace and the condition of its product; but since, in the case of both the natural and the dry blast furnaces the working as well as the product is considered at an average, "uniformity" has no significance in accounting for the saving in fuel. Can any one familiar with the phenomena of blast furnace operation doubt that, with equal uniformity of the moisture in the blast at its maximum instead of its minimum quantity, there would have been equal uniformity in the working and product of the furnace using moist blast accompanied with higher instead of lower fuel?

Concerning the "critical temperature" theory, there may or may not be such a condition as applied to the working of the blast furnace. It is evident, however, that there must be a sufficient temperature. From the data of the working and product of the two furnaces reported by Gayley, we know that the temperature, critical or otherwise, was sufficient in each case. Although we do not know the degree of temperature, we do know, what is of the utmost importance, that it was precisely the same and is accurately measured by the composition of the iron and the slag from each furnace—therefore, this theory will not account for the results obtained by the use of dry blast.

As to more oxygen per day and faster driving, Richards says:

"Weight of oxygen present as air (natural blast), 96.3 kg. per 100 kg. of iron," equivalent to 0.963 ton per ton of iron, which, multiplied by the daily output of 358 tons, gives oxygen per day, 344.75 tons.

"Weight of oxygen present as air (dry blast), 76.5 kg. per 100 kg. of iron," equivalent to 0.765 ton per ton of iron, which, for daily output of 447 tons, gives oxygen per day, 341.95 tons; difference, 2.80 tons.

Or only 0.71 per cent. Evidently this small difference cannot account for the difference in results.

"Increased reducing power" is given as a reason. This is a mistake also. I give the following conclusions, computed from data given by Richards:

Carbon of CO, Burned to CO_2 in Reducing Zone, per Ton of Iron.

	Ton.
Natural blast (Furnace C)	0.263
Dry blast (Furnace D)	0.2555
Difference in favor of natural blast	0.0075

"Increased smelting capacity" is the next reason advanced. Right here is the nut; and I think Richards has mistaken the husk for the kernel. The converse of his statement is the true reason; that is to say, less smelting capacity is required.

The direct saving in heat requirement for the decomposition of the moisture of the blast, shown to be 113 heat units, or 2.93 per cent., is increased a little by the slag smelting requirement, and this is still further increased nearly three-fold by the saving in heat carried off by the gases and by radiation, until we have a total saving of 477 heat units, or 12.36 per cent. . . . Several writers who have found it difficult to account for the saving of such a large amount of coke [19.6 per cent.] as compared with the quantity theoretically required for the dissolution of the moisture eliminated, have evidently assumed, in their theoretical calculations, the complete combustion of the coke to CO_2, overlooking the fact that, owing to the nature of the blast furnace process, the moisture of the blast would be dissociated at the expense of coke burned to CO, or incomplete combustion, requiring more than 3.25 times as much coke as they deem to be required.

Progress in the Reduction of Fuel Consumption.

The author reviews the various steps in blast furnace progress, particular in fuel requirements, as follows:

The evolution of the blast furnace, from the primitive form and practice, which consumed more than 7 tons of fuel per ton of iron, to the present form and practice, in which the fuel has been reduced to less than 1800 lb. per ton of iron, has been marked by five distinct epochs, each of which has produced startling immediate results, as well as permanent changes. The coking of bituminous coal before charging into the furnace, Neilson's application of the hot blast, and Bell's discovery of the relation of the form of the furnace to the proper reduction of the ores, marked three of these epochs. The next profound change, somewhat less startling in its approach and effect, had its maximum development in the wide distribution of the exceptionally rich ores of the Lake Superior region, followed almost immediately by the largely increased supply of artificially concentrated magnetites. The last epoch of progress, but not the least important in revolutionary results, has been inaugurated by Gayley's process of refrigerating the blast for the purpose of eliminating its moisture.

It is interesting to note that, of the causes above named as contributing to the reduction of the amount of fuel required to make a ton of iron, only one—that of Bell—involves any change in our view of the nature of the blast furnace process, or of the reactions taking place within the furnace; all the others pertaining simply to a better preparation of the materials (ore, blast, fuel, &c.) before they enter the furnace. The preliminary coking of the coal eliminated the volatile hydrocarbons and concentrated the fixed carbon, which only is of value in the furnace. Heating the blast by means of the escaping gas, which has performed its function in the furnace, recovers a portion of its potential heat and returns it to the furnace at the point where, owing to the nature of the process, it is most effective in oxidizing the solid fuel. Concentration of the ores, whether natural or artificial, as well as the elimination of the moisture from

the blast, reduces the heat requirements and therefore the fuel consumption.

According to the principles already known, it may be asserted, without any claim to the gift of prophecy, that there are to-day apparently no reasons, except commercial ones, why iron should not be produced in the blast furnace with 1200 lb. or less of coke per ton.

No Further Startling Fuel Economies Possible.

The conclusions reached in Mr. Langdon's investigations are thus stated:

Upon careful consideration of the facts and figures presented, it will be evident that there are no more startling economies in fuel consumption by the iron blast furnace to be achieved. Further improvement in the air blast by elimination of the nitrogen have been shown to be a detriment instead of a benefit, increasing, instead of reducing, fuel consumption.

With conditions already practically reducing the coke to about 1200 lb. per ton of iron, the saving to be effected by carrying a blast temperature above 1200 degrees F., say at 1600 degrees F., would be considerable; but, since reserve heat must be carried somewhere for emergencies, it is doubtful whther it would be advisable in practice to carry regularly more than 1200 degrees F.

Improvements in practice will no doubt enable us to reduce the moisture of the blast somewhat below 1.75 grains per cubic foot, and thus effect some additional saving in fuel. But more important future progress in the economy of blast furnace fuel must be the result of a more careful preparation of the ore, linestone and fuel, eliminating from these materials the moisture and volatile matter, and reducing the slag-making elements. Of course, the cost of such preparation will have to be weighed against the resultant saving of fuel in the furnace process itself, and the scientific furnace manager will find the problem with which he has to deal not less difficult than were the cruder problems of a more ignorant practice. In fact, as we all know, the result of scientific progress in our art is to make our responsibility greater and our task more complex. Pioneers like Mr. Gayley certainly confer great benefits upon capitalists, workingmen and the public at large; but it cannot be denied that they worry their professional colleagues!

A Great Irrigation Project in Wyoming.

What is said to be one of the largest private irrigation projects ever undertaken in the State of Wyoming is disclosed in the plans of the North Platte Valley Irrigation Company, Douglas, Wyo. This company, recently incorporated with a capital stock of $2,000,000, has taken over the La Prele Ditch Company, which is now engaged in the construction of a large cement dam on La Prele Creek, and is completing arrangements for the reclamation of 100,000 acres of land in the Platte River Valley for a distance of 35 miles between Glenrock and a point below Orin Junction. This will involve the construction of a power plant and several pumping stations.

The power plant, which will be located about a mile distant from the La Prele Ditch Company's reservoir, will be propelled by waters from the reservoir which will be carried through a steel pipe 8 ft. in diameter, and one mile in length. This plant, which will develop 7500 hp., will be housed in a steel and cement building covering a space of 60 x 90 ft., and will cost about $350,000. Current will be carried over wires from the main plant to three different stations, where pumping plants will be located. The first of these stations will be about 30 miles above Douglas, where water will be taken from one of the La Prele Ditch Company's large canals and raised to a hight of 40 ft. for the irrigation of about 24,000 acres of land. A second station, located on the Platte River a few miles above Douglas, will lift the waters of the Platte River 30 ft., carrying them through large canals for irrigating another large tract of land, and another station will be located below Orin Junction, which will lift water from the river to irrigate 16,000 acres. In this system 14 single-lift centrifugal pumps will be used, each of them having a capacity of lifting 20,000 gal. per min. through a 20-in. pipe, the entire plant having a total capacity of lifting 15,000,000 gal. of water per hour.

In addition to the power expended in pumping water for irrigation purposes, it is the intention of the company to furnish electricity for lighting and power service in various towns and cities in its vicinity. The estimated time for construction of this project, which will cost between $550,000 and $600,000, is from one to two years. The incorporators of the company are W. F. Hamilton, J. M. Wilson, B. J. Erwin, W. F. Cox and others.

Segregation and the Size of Steel Ingots.

Prof. Henry M. Howe, New York, makes a short contribution to the *Transactions* of the American Institute of Mining Engineers on "The Influence of Ingot Size on the Degree of Segregation in Steel Ingots." The natural effect of large size, he says, should be to increase segregation. In a previous publication Professor Howe cited the excessive segregation in many large ingots as tending to confirm this, but he showed also that in the case of ingots less than 16 in. sq. this expected effect of ingot size is liable to be masked by that of other variables. Under these conditions the real effect of size would be shown by taking the average of large numbers of cases so that other variables might offset each other.

As showing that the degree of enrichment does increase with ingot size when thus studied, Professor Howe gives the accompanying diagram representing the average degree of enrichment in 49 different ingots divided into

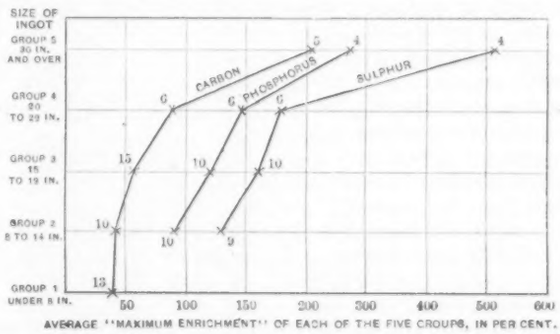


Diagram Illustrating the Influence of Ingot Size on Maximum Enrichment in Steel Ingots.—The "maximum enrichment" of each ingot, *i.e.*, the excess of the richest spot over the average of the whole ingot, is first calculated in percentage of that average. The average of the maximum enrichment of the several ingots of a given group is the abscissa in the diagram. The number beside each spot tells the number of cases which that spot represents.

five classes according to their size. This diagram also brings out prominently the fact that the enrichment in sulphur is greater than that in phosphorus, and that in phosphorus greater than that in carbon. The detailed data on which the plottings are based will be published soon. The diagram, which is based on the enrichment at the richest point found in each ingot, further tends to show that the effect of ingot size is relatively slight until the thickness of the ingot reaches something like 20 in., but that with further increase of size the enrichment increases more rapidly.

That even very small ingots may be greatly enriched by segregation Professor Howe shows by illustrations representing the microstructure of the neighborhood of a small cavity in the upper part of the axis of a small test ingot. The ingot was only about 15-16 in. wide at its widest part and about 5 in. long. One photograph shows that some of the metal had been enriched in carbon so much as to have turned into white cast iron, with somewhere about 3 per cent. carbon. The eutectic areas, it is estimated, contain more than 4.3 per cent. carbon. The diminutive ingot was of acid open hearth steel. After it had sunk to a moderate red heat it was quenched in water. The metal from the outer part of this ingot contained 1.08 per cent. carbon, so that the enrichment even in so minute an ingot proved to be about fourfold.

Maurice Connolly, president of the Carriage Builders' National Association, in addressing the recent convention at Washington, D. C., said that automobiles have displaced carriages to such an extent that carriage builders either must retire from business or devote their attention to the construction of automobile bodies.

Electric Refining of Steel.

A patent has been granted in the United States to Otto Thallner, with the firm of Bismarckhütte, at Bismarckhütte, Germany, on a process of producing steel free from oxides of iron and manganese. The experience of the inventor in electric steel refining has been with the use of the Heroult furnace. In the specification of the patent, No. 937,486, granted October 19, 1909, the inventor describes his process and the substance of his statements is given in the following:

The application of silicon to the deoxidation of steel and slag is familiar in the addition of ferrosilicon to the molten metal before or during tapping. In both cases the silicon effects deoxidation by reducing the protoxides of iron or manganese present. The silicon is not only used up in this action, but there remains also a considerable quantity of the products of the reduction, such as silicic acid, in such a fine state of division emulsified in the metal that it is not capable of separating out in the short time before pouring. The result is that only a small quantity of the pure silicon remains in solution in the steel, and as this small quantity only acts for a short time it has practically no influence on the internal structure of the steel. On the contrary, the fine emulsified silicic acid has a disadvantageous action on the internal structure. If it is desired to cause the silicon to act advantageously on the internal structure the metal must contain a greater quantity of the silicon and be subjected to the protracted action of the silicon at the melting temperature.

In the open hearth furnace a strong blowing action is obtained in consequence of the gases of combustion; that is to say, there is a constant excess of oxygen present in the slag and it has a constant blowing action on the metal bath below it. It is, therefore, impossible to obtain a constant percentage of carbon in the metal in a basic lined furnace of this kind, as the carbon, in contact with the slag, which is rich in oxygen, is subjected to constant changes, as also is the manganese in the metal bath. This oxygen, of course, also affects the silicon, as the silicon has a great affinity for the oxygen in the slag, and passes over into the slag as silicic acid. It appears, therefore, to be impossible to retain pure silicon dissolved, with a basic open hearth furnace, and it appears also impossible to obtain a favorable action of the silicon on the internal structure of the steel. There still remains the possibility of adding the silicon before tapping or in the ladle. Silicon, of course, always reduces the protoxide of iron and manganese out of the slag in an open hearth furnace. The object aimed at, however, was difficult to obtain, as the metal below the slag might still remain rich in oxygen, and in addition very large quantities of silicon were necessary to bring about the permanent silicizing, as the slag constantly took up oxygen from the combustion gases, and this oxygen had to be continuously removed. The slag was, therefore, always more acid in its nature and increased in its tendency to give up oxygen to the metal bath. It may, therefore, be assumed as a practical impossibility to melt metal in a basic flame-heated furnace and still retain a reasonable proportion of silicon in solution.

Mr. Thallner's discovery was that the protoxides may be removed and pure silicon taken up in solution by the steel by treating blown steel in an electric furnace with a basic lining—heating the steel together with silicon. The electric furnace with a basic lining, in consequence of the high temperatures obtained, retains the slag in a much more basic character than was at all possible in an open hearth furnace. The consequence is that the slag is less liable to take up oxygen from the air, as there is no oxidizing flame present in the electric furnace. Proof of this is the fact that the metal may be heated for several hours in an electric furnace with a basic lining without altering the percentage of carbon and manganese. Further proof is the fact that the slag may be retained free of iron for several hours. This circumstance alone permits the carrying out of the following process:

The open hearth steel or the melted product from any other blowing apparatus is passed into a basic electric furnace. Sufficient ferrosilicon is added either in the electric furnace or when tapping into the ladle to completely deoxidize the metal, and so that a fixed amount of pure silicon remains in solution. When added in the electric furnace the ferrosilicon may be laid in the furnace and the metal poured thereon or the ferrosilicon may be thrown on the top of the metal bath before the lime is added for forming the slag. It would, of course, also be possible to add part of the silicon to the metal before passing it to the electric furnace and the other part after.

The chemical action which results is thus described: The product of the deoxidation, which is emulsified in the metal, has time during the melting in the electric furnace to separate out and this product passes in the form of silicic acid into the slag. The pure silicon held in solution is neutral as regards the basic lining. In consequence the basic lining of the furnace is not attacked, whereas the excessive addition of silicon on a basic open hearth furnace led to the formation of large quantities of silicic acid which attacked the lining of the furnace very severely. If the slag in the electric furnace still contains iron protoxide, the iron in the slag is gradually extracted by means of the silicon in the bath, and this reduction takes place at the contact surface between the slag and the metal bath. The reduction further takes place until the whole content of silicon has been used up or until the slag is free of iron.

In order to retard the loss of silicon it is necessary to accelerate the deoxidation of the slag. This may be effected by throwing on charcoal or the like, or aluminum compounds, or even pulverized ferrosilicon. When the slag becomes white or falls to a powder in the air deoxidation is complete and it may be assumed that the metal bath below the slag is in a proper state for taking up pure silicon, and that the silicon remaining in solution in the metal will no longer be used up. In consequence if further additions of ferrosilicon are made, the silicon acts on the internal structure of the metal, so that the resulting product is just as fine in grain and as tough as if the metal had been treated in an acid lined electric furnace or in a crucible. This is really the novel technical effect obtained by the invention, viz., to bring about the permanent action of the pure dissolved silicon on the internal structure of the steel in a basic lined furnace. The action of the silicon in deoxidizing the slag from the metal bath upward, is also an important feature of the metallurgic action.

The Crucible Steel Company's Officers.

At the organization meeting of the Board of Directors of the Crucible Steel Company of America held in Pittsburgh, October 28, the election resulted as follows: Executive Committee: Herbert DuPuy, Frank B. Smith, George E. Shaw, H. S. A. Stewart, J. D. Lyon, Reuben Miller and James H. Park. Officers were elected as follows: Herbert DuPuy, chairman Executive Committee; Frank B. Smith, president; Reuben Miller, first vice-president; John A. Sutton, second vice-president; C. C. Ramsey, third vice-president; O. H. Wharton, fourth vice-president; Chas. W. Rowlands, secretary; Geo. A. Turville, treasurer; N. W. Nolen, comptroller; A. A. H. Niebaum, assistant treasurer. To fill the vacancy in the Board of Directors caused by the death of the late William H. Singer, H. D. W. English was elected for the unexpired term. H. A. Brown, assistant general sales agent, has been promoted to the position of superintendent of branches, with headquarters at Pittsburgh, effective November 1. Reuben Michener, manager of the Chicago office, has been promoted to the position of assistant general sales agent, with headquarters at Pittsburgh, effective November 1.

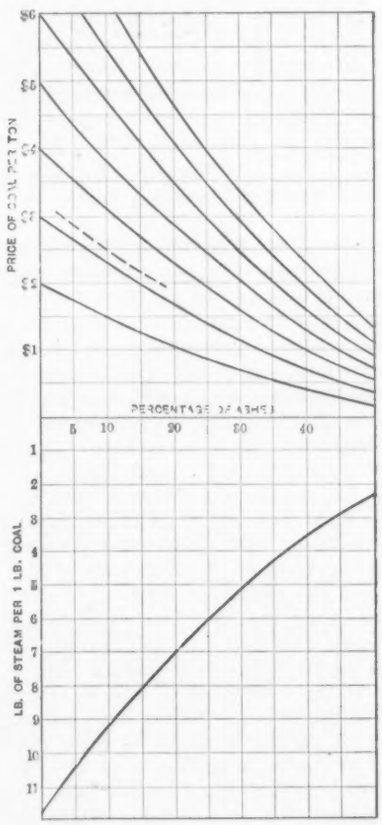
The November *Pipe Parley* of the McWane Pipe Works, Lynchburg, Va., bears on its front cover the praiseworthy sentiment, "We don't consider our pipe 'good enough' unless it is the best that can be made."

The Value of Coal in Terms of the Ashes.

The Price of Coal and Evaporating Value as Effected by the Incombustible.

The *Metal worker*, in a recent issue, presented the following discussion of a subject which is of practical value to large consumers of coal:

Some time ago an interesting article was contributed to *La Revue Electrique* by J. Mathivet on the approximate determination of the price of coal and its evaporative power as effected by the ash content. It has suggested the following development of the theory with the accompanying chart. The chart is to show the relation between the ton price of coal and the percentage of ash or incombustible remaining and also the relation between the amount of steam which can be evaporated as the percentage of ash increases. The former relation is shown in the upper set of curves and the latter in the single curve below. Each of the upper curves represents what the coal should cost per ton so that the cost of generating one pound of steam will not vary as the percentage of ash varies. In other words, if one follows one of



Effect of Ashes in Fuel on Price and Evaporation.

these curved lines he will find as the percentage of ash increases the ton price of the coal must decrease in order that one pound of steam may always be generated at the same cost.

A practical result may be pointed out as follows: With coal at $2.50 per ton and containing 10 per cent. of ash we find that it is as good as coal costing $2.90 per ton, but having only 5 per cent. of ash. This is ascertained by drawing a curved line parallel with the neighboring curves, as indicated in the short dotted line. It means that if one were purchasing coal in respect to its ash content, as is now a leading factor with many large buyers of fuel, coal containing 5 per cent. of ash, but costing less than $2.90 per ton would be decidedly better than coal containing 10 per cent. of ash selling for $2.50. Similarly coal at $3 a ton and containing 25 per cent. of ash is as good as coal costing $4.10 and having 15 per cent. of ash, because one pound of steam is generated for the same price in both cases, but with this one very important consideration. With the lower priced coal and its larger percentage of ash, less heat is obtainable from one ton of coal and therefore the evaporation is decidedly less. This is shown in the lower curve, where it is found that with 25 per cent. ashes one can expect 5.8 lb. of steam per pound of coal while with 15 per cent. ashes the evaporation appears as great as 8 lb. of steam per pound of coal. This last curve shows for example that if coal contains 10 per cent. ash, an evaporation of 9 lb. of steam per pound of coal should be obtainable.

The theory on which these curves are drawn and which takes into account the cost of handling the coal as well as the initial cost, may be explained briefly as follows: If we multiply the calorific value of the fuel by the efficiency of the boiler, this product gives the amount of heat obtainable from each pound of coal burned. If we divide the amount of heat required to generate one pound of steam by the amount of heat which the boiler will develop from one pound of coal, the result will be the fraction of a pound of coal necessary to generate one pound of steam. If we then multiply this fraction of a pound by the cost of a pound of coal based on its ton price plus the cost of handling the coal, the product gives the cost of generating one pound of steam.

The price of handling the coal is placed at 20 cents per ton. This has been taken into account in getting the curves, but the prices stated in the chart are the usual selling costs. The efficiency of the boiler is taken at 80 per cent. when the coal is free from ashes, in other words, it is taken at 80 per cent. for the ideal condition. For any other condition 1 per cent. is deducted for every percentage of ash, so that with 10 per cent. of ashes the efficiency of the boiler is placed at 70 per cent. For the calorific value of the fuel, if one takes, for example, 14,500 as the number of heat units obtainable from one pound of combustible, a reduction of 1 per cent. of the calorific value is made for every per cent. of ash. In other words with 10 per cent. ashes the calorific value would be placed at 90 per cent. of the calorific value of the fuel with no ashes present, or 90 per cent. of 14,500. Finally it may be stated that the equation for the ton price of the coal is $p = 0.00065\ (100 - x)\ (80 - x) - 0.20$, in which x represents the percentage of ash and when the ton price is $5 without any ash. The equation is of a similar form with different coefficients, depending on the base price of the coal. The equation for the evaporating power is $v = 0.00145\ (100 - x)\ (80 - x)$ based on a calorific value of 14,500 B.t.u. per pound of combustible.

Connellsville Iron Works Orders and Improvements.—The Connellsville Iron Works, Connellsville, Pa., has received a contract for two new cold blast mains for the two blast furnaces of the Dunbar Furnace Company, Dunbar, Pa., which are to be completed in February. Two large steel water storage tanks, 40 ft. in diameter and 40 ft. high, are being built for the Pittsburgh & Lake Erie Railroad, one for Jacobs Creek and the other for Newell Station, where a large chemical plant is now being built. The company recently completed a large contract for a coking plant, including locomotive, boilers, steel cars, pumps, rails, &c., for the Franklin Coke Company, Franklin, Pa. It recently added to its own works a 5-ton steel derrick for use in loading and unloading material on its siding, and is now improving the physical condition of its plant by erecting a new galvanized sheet roof over the buildings. It is also adding a new 30 x 90 ft. addition to its machine shop. Work will be commenced at once, and it is expected that the addition will be ready for operation in about two months.

A significant feature of present design in the construction of moving machinery is the tendency to substitute light sheet steel for the heavy malleable iron formerly considered necessary in many parts, such as gear cases for electric railroad motors. This is made possible owing to the increase in the elastic limit of steel used for such purposes, as well as the improved mechanical construction which guards against unnecessary strains, and in many instances it materially reduces costs.

Moeller Air Filters for Machinery.

The firm of K. & Th. Moeller, Brackwede, Germany, has specialized for years in the manufacture of air filters. Recently this firm has introduced a special form of filter for separating dust and foreign particles from air supplied to compressors, air pumps, blowers, compressed air machinery, gas engines and for the cooling of electric generators, &c. Eliminating dust and dirt not only prevents soft deposits in the suction pipes, but the more serious solid deposits within the machinery formed when foreign matter mixes with water and oil. Such deposits soon affect the moving parts, destroying air tight joints, valve seats, &c., and increasing the friction, entailing waste of power and excessive wear, calling for frequent renewals. In turbo blowers the disadvantage of the presence of foreign material is clearly evident, as it is wont to deposit in the small channels of the stationary and rotary vane disks, and in the small clearance between these and the housings, impairing the efficiency. In gas engines it is not only the gas that carries impurities, but also the air for combustion. The former fact is recognized and the gas is usually cleaned, and it is maintained by the manufacturers of this apparatus that the air should be also. Neglect to do it leads to the same results as in air compressors. In compressors the trouble does not stop with them, for if the air is dirty it will pass on to the compressed air tools and other machinery, producing wear of their parts and reduction in efficiency.

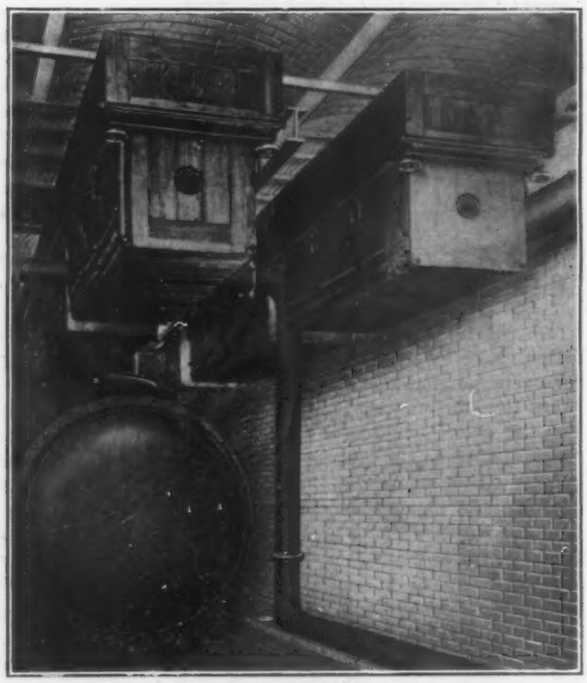


Fig. 2.—An Installation of the Air Filters Made by K. & Th. Moeller, Brackwede, Germany.

In Fig. 1 the internal construction of the filter, which is the invention of August Rahe, is shown. A photographic view of an installation is given in Fig. 2, and typical applications are illustrated in Figs. 3 and 4. Essentially the filter consists of a number of frames open at one end and closed at the other, placed side by side with their open ends facing alternately in opposite directions and wound in zig zag fashion with a filtering cloth so as to form filter pockets between the adjoining frames. Each filter pocket is open at one end and there is in each case only one thickness of fabric between adjoining filter pockets. The filtering fabric is folded around each frame and fastened at its ends to the outer frames, which are adapted to be clamped together and to be fixed in any desired position relative to one another. The frames are arranged in alternating series, the open ends of one series being presented at the inlet end of the filter and the open ends of the other at the delivery. The frames are fastened together by clamping bars, which inclose the frames as a whole and can be tightened by right and left hand thrust screws.

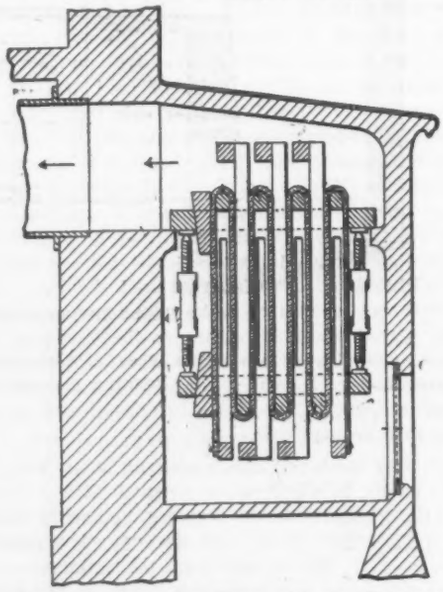


Fig. 1.—Sectional View of a Filter with the Thickness of the Fabric Greatly Exaggerated.

The thoroughness with which the filter separates dust from the air depends on the closeness of the weave of the fabric, and the resistance imposed to the air on the mesh of the fabric and the number and length of the filtering pockets provided. It will readily be seen that there is a wide latitude in the construction of the filter to adapt it to the conditions in any specific case. The advantages of the type are that it does not augment the humidity of the air nor seriously increase the resistance to its flow. At the same time it is reliable, inexpensive, requires little attention and occupies little room. Even though an installation of machinery which calls for air filtering may not have been so provided for originally, no great amount of expense or work is involved in adding the filtering system. Advantages of the use of the filters are reduction in expenses for mounting and dismounting

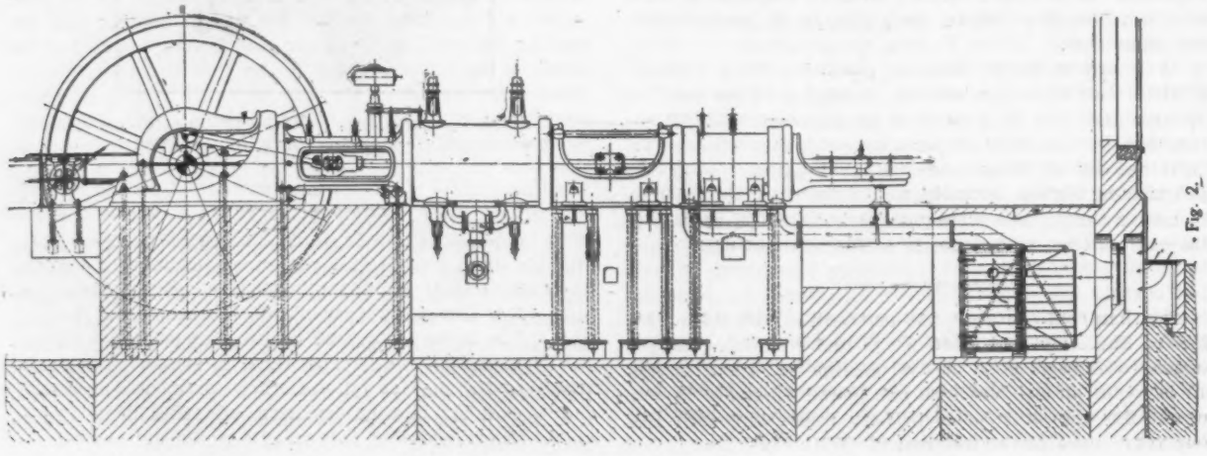


Fig. 3.—A Gas Driven Blowing Engine with Filter in the Intake.

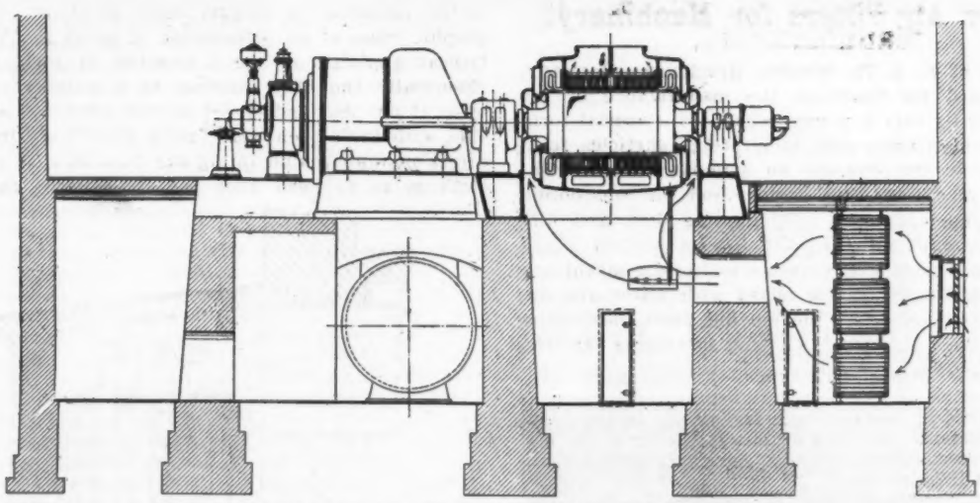


Fig. 4.—A Turbo-Alternator with the Windings Cooled with Filtered Air.

machines to clean them, saving in wear of the machine parts, maintenance of tight joints, keeping the efficiency high, lengthening the life of the machine, and insuring safety against breakdowns.

As the filter cloth becomes soiled or laden with dust it may be easily brushed off or cleaned with a vacuum cleaner, and when it finally becomes necessary may be replaced with a clean cloth and the old one washed for the next renewal. With clean cloth the resistance to air flow is usually made not to exceed 1 mm. water column. This resistance is gradually allowed to rise with the soiling of the cloth to 6 or even 8 mm. water column, which may not occur for weeks or even months.

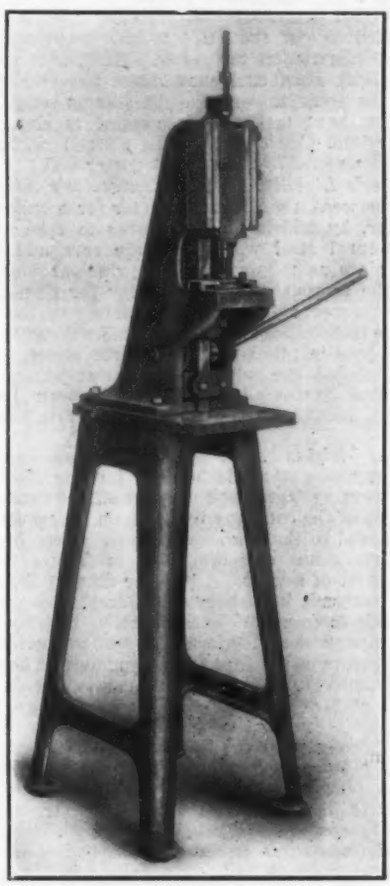
Figs. 3 and 4 suggest ways in which the little space required for the filters can be found. They can be installed under almost any condition however unfavorable and crowded. To provide for such cases the largest sizes are built in various types and widths of equal capacities. A pocket frame filter of 350,000 cu. ft. capacity per hour, for instance, requires, with the room needed for installing, and including the wooden casing only 127 cu. ft.

One of the important uses to which these filters have been put abroad is in connection with the ventilation of high speed electrical machinery. Forced ventilation keeps down the heating and makes possible much larger output for a given size of machine. It is not yet common practice in this country, but from present indications is likely to be extensively adopted. In open type machines a certain amount of natural cooling can be relied upon and frequently parts corresponding to fan blades are incorporated in the rotating element to increase the effective cooling. The plan is a good one where the air is clear and free from dust, but it is the argument of the builder of this apparatus that under other conditions and preferably under all conditions the machine should be inclosed and cooled only by filtered air drawn in either by the blower action of rotor designed with that in view, or supplied with air under more or less pressure from an independent blower. The desirability of such an arrangement is most clearly apparent in connection with electric generators directly connected to steam turbines, and consequently driven at high speeds, when of necessity they are made as small in diameter as allowable. Artificial cooling makes possible a more compact generator, as higher current density is not attended with excessive heating. Eliminating dust from air supplies to electrical machinery means not only saving in wear, but maintaining higher efficiency and preventing the danger of short circuits, both consequences of the clogging of the clearance spaces with deposits of foreign matter.

The American Bridge Company, at Pittsburgh, has sold to the American Steel & Wire Company 10 steel barges, to be used by the latter for hauling coal from its mines to its plants, and also for transporting billets between different works. About 60 tons of structural shapes are used in the building of each barge.

A New Standard Hand Press.

The hand press illustrated, recently brought out by the Standard Machinery Company, Providence, R. I., is of a new type, in which the slide is operated similarly as the spindle of a sensitive drill press. The machine consists of a cast iron frame set on a table and legs, and



A New Hand Press for Light Metal and Glass Forming, Made by the Standard Machinery Company, Providence, R. I.

in which a slide moves up and down. The slide is cast as a single piece, and is attached to a machine steel rack, in which works a pinion mounted on the shaft with the hand lever. This particular machine is used in the manufacture of glass thermometer bulbs, and the flame of a Bunsen burner blows constantly across the table. The bulbs are placed on the plunger and a downward pull of the lever forms them to shape. The press is also used in making jet and other ornamental products. The mechanism is very sensitive, adapting it for work where a hand wheel or foot treadle would not answer.

Judicial Decisions of Interest to Manufacturers.

ABSTRACTED BY A. L. H. STREET.

Contracts by Agents—Right of Principal to Sue.—An undisclosed principal may sue on a contract made by his agent. Where a contract for sale of an engine embraced warranties that if any part should be broken or useless the seller would repair without charge upon return of the engine to the factory, and that the engine would do good work when properly handled, the warranties were separate, and the buyer was not required to return the engine for repairs before suing for breach of the warranty that it would do good work. (Rhode Island Supreme Court, Battey *vs.* Lunt, Moss & Co., 73 Atlantic Reporter 353.)

Contracts in Restraint of Trade.—An agreement, without limitation as to space or territory, not to carry on a particular trade or business, such trade being in itself lawful, is unenforceable, as being against the policy of the law. (Georgia Supreme Court, Seay *vs.* Spratling, 65 Southeastern Reporter 137.)

Agents—Authority to Employ Sub-Agents.—To entitle plaintiff to recover commissions on a sale made under an alleged agreement with defendant's agent, plaintiff must prove that the agent acted on defendant's expressed or implied authority, or that the agreement was subsequently adopted by defendant or the proceeds accepted with knowledge of the circumstances. There is no presumption that the secretary of a corporation has power either to appoint agents or to ratify appointments previously made without authority. Plaintiff volunteered to assist defendant's agent in selling a steel safe, and claimed that the agent promised that, if the sale was made, plaintiff should receive compensation. The price asked was $18,000, but the buyer offered $13,000, and defendant finally acceded to these terms. The agent on several occasions told plaintiff that, if defendant was compelled to cut the price to the lower figure, there would be no commission for either. Held, that plaintiff by remaining silent when such statements were made, thereby permitting the agent to conclude the sale on terms he might not otherwise have made, was estopped to claim commission. (Maryland Court of Appeals, Carroll *vs.* Manganese Steel Safe Company, 73 Atlantic Reporter 665.)

Contractor's Liability for Sub-Contractor's Negligence.—A contract between a general contractor for a building and a subcontractor, by which the latter was to take all the required structural steel work from the cars and haul and erect it in place as required by the principal contract, and to assume the responsibility of and pay for any damage to persons and property during the fulfillment of the contract, rendered the subcontractor an independent contractor, for whose negligence in piling material in the street, whereby a person was injured, the principal contractor was not responsible. (United States Circuit Court, Eastern District of Pennsylvania, Morning *vs.* Cramp & Co., 170 Federal Reporter 364.)

Telegrams—Rights of Telegraph Companies.—A telegraph company cannot evade liability for any negligence by contract. The mere fact that a message offered did not comply with the rules of the company by being on its regular blanks, but is telephoned to the operator, does not affect its liability, where the negligence complained of is failure to deliver. Upon the receipt of a message, it is the duty of the telegraph company to transmit it without delay, and if from any cause it is impossible to transmit the message, or if delay be necessary, the company should inform the sender; certainly so if the message shows on its face the importance of hasty transmission and delivery. Telegraph companies have a right to provide reasonable regulations as to hours during which they will do business, and the reasonableness of the regulation will depend largely upon the character of business done, the locality of the office, and is often a mixed question of law and fact. A telegraph company cannot receive or transmit messages out of its office hours, especially when that fact is not brought home to the patron, and then set up that regulation as a defense to an action for a breach of its contract or for its negligence in failing to deliver. (Alabama Supreme Court, Western Union Telegraph Company *vs.* Hill, 50 Southern Reporter 248.)

Telegrams—Notice to Telegraph Company of Contents.—In order to charge a telegraph company with liability for damages growing out of its neglect to correctly transmit a dispatch ordering the purchase or sale of a certain commodity, it is not necessary that the message should, on its face, disclose the nature of the business, so that the operator may understand its meaning as to the article, quantity, quality and price. If enough appears in the message to show that it relates to a commercial business transaction between the correspondents, it will be sufficient to charge the company with damages resulting from its negligent transmission. (Oklahoma Supreme Court, Western Union Telegraph Company *vs.* Blackwell Milling & Elevator Company, 103 Pacific Reporter 717.)

Patents—Rules Governing—Infringement.—In judging of invention, in case of doubt, regard may be properly had to the efforts of other inventors in the same field, particularly where there are not a few both before and since, as well as to the difficulties to be overcome and the success of the device, where in the number and quality of the articles produced it has been marked. The test as to whether a device is a patentable combination or a mere aggregation of parts having no combined action is whether there is a new unitary result to the production of which the different elements coact; and where this appears it is immaterial that there are different steps in the operation to which the different parts are successively addressed. It is not necessary that the article manufactured shall be produced at a single stroke, in which all the elements are involved. Where an infringement is deliberate, with every means taken to avoid being responsible for it, if there is any uncertainty on the subject of profits made, it is for the defendants, and not the complainant, to clear it up. Although the difference between an infringing and a noninfringing machine may consist of a single feature, the profits recoverable upon an accounting for the use of such machine are not to be confined to the saving secured by this one feature. Infringement being of the whole machine, and the defendants having got the benefit, not of one feature, but of the whole, it is not to be divided around. It is not as though they were being charged for infringing sales, where the profits recoverable would properly be so limited. (United States Circuit Court of Appeals, Third Circuit, Novelty Glass Mfg. Company *vs.* Brookfield, 170 Federal Reporter 946.

Patents—Water Tube Boiler Infringement.—A corporation charged with infringement of a patent is not estopped to deny its validity merely because the patentee who sold and assigned it is a subordinate in its employment. The Park patents, No. 747,329, for a baffle wall brick used in the construction of baffle walls of water tube boilers, and No. 744,015, for a handhole cover for closing the handholes in the headers of water tube boilers, are both void for lack of patentable invention in view of the prior art. (United States Circuit Court of Appeals, Sixth Circuit, Babcock & Wilcox Company *vs.* Toledo Boiler Works Company, 170 Federal Reporter 81.)

Liability of Manufacturer for Damages Caused by Dangerous Appliances.—A large coffee urn for use in a hotel was constructed in what is called a "battery of three," the central urn or boiler being equipped with a coil of pipe through which the steam was driven whereby the coffee was made. The central urn was of considerable diameter and from 3 to 4 ft. high. The urn was sold through a jobber, and on practically its first use its bottom was partially driven out by force of steam and water, causing an accident. Held, that the manufacturer and seller of such an appliance were liable to the third persons on the theory that they knew the purposes for which it was to be used, that its inherent character was such that when used it was liable to be dangerous to many people if not carefully constructed so as to be imminently dangerous when employed as intended to be, and exploded as the natural and direct result thereof. A manufacturer of an inherently dangerous article may become liable for its negligent construction, which, added to its inherent character, makes it imminently dangerous and causes or contributes to a resulting injury, not necessarily incident to its use if properly constructed, but naturally following from a defective construction. (New York Court of Appeals, Statler *vs.* George A. Ray Mfg. Company, 88 Northeastern Reporter 1063.)

Injuries to Employees—Liability.—To recover for injuries to an employee alleged to have resulted from a defective spring in a metal stamping machine, it must appear probable that the defective spring operated proximately in a natural and continuing sequence to produce the injury. If an employee working such a machine was performing the two acts of removing the stamped metal with his right hand, which a defective spring intended to perform that office made necessary, and of inserting new metal under the die with his left hand at the same instant, and the moving of the stamped metal was impeded by the defective spring so as to injure his left hand while inserting the new metal, the defective spring was the proximate cause of the injury as affecting the employer's liability. (St. Louis, Mo., Court of Appeals, Tsoulufas *vs.* National Enameling & Stamping Company, 120 Southwestern Reporter 1188.)

Negligence Toward Employees—Improper Appliances.—If a person, directing workmen who were raising a heavy steel truss with a chain and hook, knew that the hook was defective, or could have known it, he was negligent in permitting and directing its use, where such use resulted in injury to one of the workmen. Under the provision of the New York Employer's Liability act, giving a cause of action to an employee against his employer for the negligence of another employee, the same as though plaintiff had not been an employee, where the negligent employee is a person intrusted with an exercising superintendence, &c., if one employee, negligently causing injury to another by permitting the use of a defective chain, was a superintendent, the employer would not be absolved from liability, even if it had

an abundant supply of good chains, and the superintendent had neglected to substitute a good one for the defective chain. (New York Supreme Court, Appellate Division, Fourth Department, English *vs.* Milliken Brothers, Inc., 118 New York Supplement 31.)

Employees—Assumption of Risks.—A defect in a machine and the danger from it are not necessarily to be identified, and an employee may know of the one without appreciating the other; but where both were plainly visible and apparent, and the employee injured was of mature age and average intelligence and familiar with the use of the machine, which was not complicated, and continued to use it without complaint, he must be conclusively presumed to have assumed the risk, and cannot recover from the employer for the injury. (United States Circuit Court, Middle District of Pennsylvania, Errico *vs.* Washburn-Williams Company, 170 Federal Reporter 852.)

Duties and Liabilities of Employer.—The mere fact that an employer put an Italian workman who did not understand English to work under the charge of people who did not understand Italian would not be negligence, rendering the employer liable for any injury to the workman. The rule making an employer liable for failure to furnish the employee a safe place to work does not apply to a place made unsafe by acts of employees. (Delaware Superior Court, Valente *vs.* American Bridge Company, 73 Atlantic Reporter 395.)

Relation of Employees.—An employee engaged in painting iron columns for shipment, necessitating his going upon a car where they were being loaded to paint the parts which had rested upon the floor, was a fellow employee of the employees engaged in loading the columns, as affecting the employer's liability for personal injury, they all being employed by the same employer upon the same definite object at the same time and under the immediate direction of the same foreman. An employee holds himself out as capable of doing the work he undertakes to do, and assumes the risks incident to the employment. (Delaware Supreme Court, American Bridge Company *vs.* Valente, 73 Atlantic Reporter 400.)

Employees—Fellow Servant Rule.—An iron mining company operating a railroad two miles long in connection with its business is within the Minnesota statute which abrogates, as to railroad companies, the rule releasing an employer from liability for injury to an employee caused by the negligence of a fellow employee. (Minnesota Supreme Court, Glines *vs.* Oliver Iron Mining Company, 122 Northwestern Reporter 161.)

Freight Elevators—Duty of Employers.—Where, in an action for injury to an employee who fell and was caught by the automatic gate of an elevator descending as the car went upward, the proof simply showed that the car started upward as the employee was getting in, but why it started or how the employer or any of its employees were responsible for the upward movement was not disclosed, there was a total failure of proof of negligence. A signal by an employee about to operate a freight elevator, where it moves slowly and only a distance of 15 ft., may well be deemed adequate warning and more effective for the protection of others than a bell or other mechanical contrivance. An employer is not called upon to adopt the best possible method for operating a freight elevator, but merely to operate it in a manner reasonably safe for employees. (New York Supreme Court, Appellate Division, Fourth Department, Knickerbocker *vs.* General Railway Signal Company, 118 New York Supplement 82.)

Liability of Employer Respecting Machinery.—An employer is bound to exercise reasonable care to provide for an employee a reasonably safe instrument for his work, unless the employee has assumed the risk of using a defective instrument provided. An employee assumes the risk of using a defective instrument when he knows its defective condition, appreciates the danger, and voluntarily encounters such risk. An assumption of risk implied from an employee's knowledge that a machine he is required to operate is defective and dangerous is generally suspended by the employer's promise to repair, made in response to the employee's complaint, if the employee is induced by such promise to continue his work, provided the injury occurs before a reasonable time has elapsed in which to make the repairs, unless the defect renders the machine so imminently and obviously dangerous that a person of ordinary prudence would decline to use it until repaired. (Connecticut Supreme Court of Errors, Elie *vs.* C. Cowles & Co., 73 Atlantic Reporter 258.)

A Great Naval Gun.—The Midvale Steel Company, Philadelphia, is furnishing the Navy Department a 14-in. gun which is expected to be the most powerful naval weapon so far made. The naval gun factory at Washington will do the rifling and supply the breech mechanism when it will be tested. It is 53½ ft. long, weighs 63 3-10 tons, discharges a 1400-lb. shell with a normal charge of 365 lb. of smokeless powder, and its maximum range is estimated at 25 miles. The fighting range of the gun will be five miles, and it is expected that at a distance of 9000 yards a projectile will have a force behind it sufficient to drive it through 11 in. of Krupp steel, the maximum thickness of the Dreadnought belt. At 3000 yards it is said the gun's projectiles will penetrate 18 7-10 in. of the best armor steel.

Large Orders for Rolling Stock.

The statement was given out last week by President W. C. Brown of the New York Central lines, that the expenditures by that system in 1910 for equipment and for reducing grades, straightening curves and laying new rails would amount to $85,000,000. The orders for new cars and locomotives placed in the past two weeks represent $25,000,000. The cars ordered last week and those already reported, placed in the previous week, make a total of 18,047—of which 17,850 are freight cars and 197 passenger cars. The locomotive orders total 325. Of the total of $85,000,000 referred to the expenditures for the Lake Shore Railroad will amount to between $10,000,000 and $12,000,000. President Brown said in connection with the announcement of the above orders and the contemplated placing of 165,000 tons of rails for the New York Central:

"These expenditures are absolutely necessary to meet the demands of business. The traffic records for the month of September and October up to date have exceeded anything in the company's history. The previous high water mark was for the first three-quarters of 1907, just before the panic. Every available car and engine on the entire system is in service. My latest report shows that 94 per cent. of our freight cars are in use. The remaining 6 per cent. are in repair shops, with men working as fast as possible to get them out. These figures are unprecedented. We could do 10 per cent. greater business to-day if we had the equipment to handle it."

The distribution of the 17,850 New York Central freight cars is as follows: 7400 steel underframe box cars, 5300 self-clearing steel hoppers, 1500 low-side gondolas, 2000 combination coal cars, 500 coke cars, 500 produce cars, 400 flat cars, 150 Rodger ballast cars and 100 stock cars. These cars will be divided among the various lines as follows: New York Central & Hudson River, 5650; Lake Shore, 5500; Michigan Central, 2300; Big Four, 1500; Pittsburgh & Lake Erie, 2500; Rutland, 400; total, 17,850.

The Baltimore & Ohio Railroad, which has already placed upward of 5000 cars this year, gave out 4400 additional freight cars last week, contracting with the Standard Steel Car Company of Butler, Pa., for 2400 steel hopper coal cars; with the Cambria Steel Company, Johnstown, Pa., for 1000 steel hopper coal cars, and with the American Car & Foundry Company for 1000 steel underframe box cars.

The Pennsylvania Railroad Company, which placed large car orders this year, on some of which deliveries will not be made until 1910, is reported to be figuring on 10,000 additional freight cars for next year and 80 steel passenger cars. Car building companies have been asked by this company as to any new designs of steel cars that are in contemplation. It is stated that the order for the above cars will include several thousand steel hopper cars of extra large capacity, which have been termed the "battleship" type. These cars will have a rated capacity of 140,000 lb., and each car will require about 40,000 lb. of material, exclusive of the trucks and wheels.

Among recent car orders noted by the *Railroad Gazette* are 300 for the Ann Arbor, 300 for the Chesapeake & Ohio, 100 for the Lehigh Valley, 250 for the Berwind-White Coal Mining Company, 500 for the Toledo & Ohio Central, 100 for the Denver, Northwestern & Pacific. The Pittsburgh, Shawmut & Northern is reported in the market for 500 to 1000 steel hopper cars, and the St. Paul for 250 passenger cars. Of locomotive orders apart from that of the New York Central the largest are those of the Baltimore & Ohio for 50, placed with the Baldwin Locomotive Company, and of the St. Paul for 100 divided between the Baldwin and American companies.

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Steel Corporation Earnings and New Work.

The remarkable way in which the stock of the United States Steel Corporation has led in the upward movement in securities in the past six months gave unusual significance to the quarterly statement issued last week. Comment naturally ran to the questions of earning power and disposition of earnings. Less was said than might have been expected on the ability of the Steel Corporation to make so close an approach to prosperity earnings on business taken much below a prosperity level of prices. The economies mastered since 1907 are apparently greater than has been supposed, and they become more noteworthy in view of the general maintenance of prosperity wages. No little interest will now be taken in the reports of the independent steel companies for 1909, to note in what degree they have been able, under the stress of this year, to come up to this remarkable achievement. The diversity of the products of the Steel Corporation subsidiaries, it is to be said, gives it a vast advantage over some producers in a year when railroads are poor buyers.

The reappearance of appropriations for new construction is the most significant feature of the third quarter's statement. It calls attention to some very strange ideas that have had currency in the stock market furore over steel shares. There has been an impression seemingly that by some marvel of high finance the necessity of applying earnings to such uses was to be done away with. There were even intimations that bond issues would be an advantageous way of solving the problem, insuring to the stockholders the largest distribution of surplus earnings. We have called attention from time to time to the tremendous capacity of the steel industry for the absorption of capital—its almost insatiate demand for money for new construction and the replacement of plant. It is to be questioned if the study given the subject in the changes that have been crowding upon the industry in the past decade has yielded any really satisfactory data as to proper allowances for depreciation, replacement and new property. The allowance for mineral exhaustion, for example, has been quite inconsistent with the high latter-day basis of mineral capitalization. The swiftness of changes in the steel industry, with the destruction of plant values, has been given far too little weight in some recent comments on the subject. At the moment the problem of the operation of certain plants based on the Bessemer converter forcibly emphasizes the point. One famous rail mill in the Pittsburgh District is a conspicuous example. The expenditure of money for new plant may or may not be adding so much to the previously reckoned producing capacity and to nominal assets. It may be merely compensating for an earning capacity that had become impaired or for a property that the progress of the industry had practically wiped out. When for the two years 1906 and 1907 the directors of the Steel Corporation appropriated more than two dollars for replacements and new property for every dollar paid as dividends, their policy was considered in some quarters to be ultra conservative. As is well known that policy merely enabled the corporation to retain its proportion of the country's total production of steel. And when in such years as 1908 these appropriations are suspended there is nothing more certain than that they must be resumed later, and on a scale compensating for the omissions of periods of leanness. It is of interest, in connection with some comments on this subject, to compare the appropriations from Steel Corporation earnings in 1906, 1907, 1908 and 1909. In the statement below the five classes of these appropriations are set down in the following order: 1. Depreciation and extinguishment. 2. Extraordinary replacement funds. 3. Special replacement and improvement funds. 4. Appropriations on account of expenditures to be made for additional property and construction. 5. Appropriations for Gary, Indiana:

	1906.	1907.	1908.	1909. (3 quarters.)
Dep. and extin..	$5,857,411	$6,681,746	$3,844,214	$15,859,837
Ext'y rep. funds.	15,395,861	15,560,237	11,532,897	
Spec. rep. & imp.	7,500,000	3,500,000	.....	.....
Ad'l prop. & cons.	28,500,000	38,500,000	.....	10,000,000
Gary, Ind.....	21,500,000	18,500,000	.....	.....
Totals.....	$78,753,272	$82,741,983	$15,377,111	$25,859,837
Dividends	35,385,727	35,385,727	35,385,727	30,356,563

It will be seen that while the appropriations from earnings in 1906 and 1907 for the renewal of the Steel Corporation's plants and the maintenance of its position were $2.28 as against $1 of dividends, the situation was just reversed in 1908, and $2.30 was devoted to dividends as against $1 applied to renewals. In the period of prosperity the industry is facing it is to be expected that a return will be made to the scale of appropriations that marked the last years of good earnings. It would not be surprising, indeed, in view of the tentative plans of some of the subsidiary companies for extensions, the further requirements of the Gary programme and, most of all, the activities of the Steel Corporation's competitors in new construction, if the amounts set aside in 1910 and 1911 exceeded the average of 1906 and 1907.

Machine Tool Costs and Efficiency.

Machine tool builders have often pointed out and proved that even though their prices are much higher than they used to be, the ratio of cost to selling price has not changed to anywhere near the same extent. The buyer of a machine gets a great deal more than he did a few years ago. He may pay twice as much to-day. With some houses the lists have advanced to that extent in considerably less than a decade. But he is getting a tool that does more than twice as much work. There are many demonstrations of this. The new steels, higher powers, improved mechanisms, new conveniences to increase the workman's efficiency, have all contributed to the result. It is easy to see where the better machine at the higher price may be an economy. If its builder makes a larger profit he deserves it. And if one machine costing $1000 will do as much work as two that cost $500 each, there is a saving in cost of labor and in floor space

and other overhead expenses. The high grade tool now received from the works of a successful builder will usually accomplish much more than twice what used to be thought an excellent record for the machine from which it was developed.

Prices do not tell the story. The progressive manufacturer who uses machine tools considers their cost in relation to what they will produce and to the saving they will effect as compared with their predecessors. It may not be expedient for the tool builders to raise their prices generally at this time, but when orders begin to exceed shop capacity advances may be looked for. And if they come it should be recognized that the machine tool builder deserves no less ample return for his investment, his enterprise and his skill than any class of manufacturers.

Cost Systems in the Navy.

The effort to put the United States Navy on a basis that will secure the maximum of results for the money expended is taking several definite forms. The installation of a cost system in a certain navy yard, with the idea of extending it eventually throughout the naval stations, is one. Another is the establishment of an office in the Department which shall be charged with keeping records of steaming efficiency of all naval ships, looking to a competitive system as complete as that which applies to gunnery. The conduct of navy yards on a business basis, with full records of all costs and the correction of any extravagance located, should make an important difference in the country's expenditures for the navy. As the matters stand, a manufacturer operating works with an equal capital, an equal annual expenditure and an equal number of workmen would be able to accomplish vastly greater results. It would make no difference if he were hampered by the same restrictions concerning labor, including wages and an eight-hour working day. He would so closely follow his costs, checking the results at one works with those of another and one man's labor with another's, that leaks and wastes would soon come to light. Then he would act. The excessive expense of some of the navy yards would be set before the country so pointedly that no sectional influence could prevent their abolishment sooner or later. Departments would be co-ordinated.

This is the direction in which the Navy Department is moving. In the same way the efficiencies of the engineering staffs and the equipment of ships will be recorded and compared. Where one ship is operated more cheaply than another the reason will be found, if possible. If it is a case of personnel, doubtless changes will be made. If it is a matter of equipment, the weaknesses will be avoided in future practice. The initial cost system will be established at the Boston yard. It will be carried out in connection with the projected amalgamation of the several departments which always have been operated independently, even to duplicate plants.

Competitive tests of steaming efficiency, growing out of the beginning made in the cruise of the battleship fleet around the world, are now applied to the entire navy. There are prizes for each class of vessel, including money rewards for the enlisted men, the whole system being on the same lines as that which has been applied so successfully to gunnery. This is a form of cost system which has the dual purpose of keeping down the total expenditure of a ship and of increasing its steaming radius on a given coal carrying capacity, a factor which strategically is of great importance. Methods such as these are in the right direction. They represent an approach in the Government service to the standards of efficiency attainable in the business of firms and corporations—something that has long been a desideratum.

Developing New Demand for Machinery.

With successful specialization in the manufacture of machine tools the[illegible]
knowledge of man[illegible]
and those who m[illegible]
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able, with consis[illegible]
years machine tool builders have given some attention to the textile industry, in the belief that the mills could increase the efficiency of their machine shops and thus decrease the cost of repair work by installing modern equipment in place of the antiquated tools upon which they usually depend. It is well understood that builders of textile machinery charge round prices for new parts and that if a textile mill could do its own work of this character with modern machines there would be a saving of no small amount. As a general thing, however, the campaign of education has been carried on in an indifferent manner, and the new tendency toward high class repair shops has come from the business sense of textile mill management rather than from the machinery trade.

A circular letter sent to the trade by one of the large milling machine companies is an example of the kind of work that can be done by manufacturers and dealers in cultivating this class of customers. One of the company's experts made a personal investigation of standard cotton mill machinery in operation in a number of the best equipped modern mills, with the purpose of forming a definite idea of the milling requirements of an average cotton mill's machine shop and the uses and adaptability generally of the milling machine. With this end in view master mechanics of these plants were consulted as to their own experiences. The result of the investigation is contained in the letter which, in part, follows:

There are three general classes of work coming up for the milling machine with more or less frequency, namely, gear cutting, key seating and surfacing or ordinary milling. Of these gear cutting is far the most important. There is a very wide variety of small gears involved in cotton mill machinery, practically all of cast iron, embracing the common straight tooth or spur gear, spiral gears of medium angles, bevel gears of small angles, worm gears, combination bevel and spur gears and ratchets. Some of the largest and coarsest spur gears are cast with teeth. Of those whose teeth are cut or machined, the diameters (spur gears) range from about 1½ in. to 12 in. or 15 in., with most frequent work on gears 3 in. to 7 in. diameter. I was told of one lot of 300 steel gears 1 in. in diameter for spindles. The bevel gears are mostly small diameters, 1½ to 4 in., likewise the spiral gears. The worm wheels and ratchets average 3 in. diameter. The extreme range is from 6 to 24 pitch, with the tendency toward the finer pitches.

The work to be done is either through the frequent repair of one or the other of these gears, or in the occasional manufacture of several hundred duplicate gears where it has been determined to change the speed of a certain lot of spindles through change of their gear ratios, &c.

All of this work is eminently suited to a milling machine, and is limited only by the character of the cutters selected. The miller should, by all means, be of the universal type, because it has in its regular equipment the universal dividing head essential in gear cutting of any kind, and because of its swivel table, which adapts the machine to the cutting of spiral gears of various angles. It has sometimes been the policy of mills to install an automatic gear cutter. In "manufacturing" gears, that is, duplicate production in quantities, it is conceded that the automatic feature is desirable, yet on the contrary, one of the master mechanics mentioned, who has used both types, states that he is able to turn out 100 or 200 duplicate gears on the milling machine in remarkably quick time, practically the same as the automatic gear cutter. When it comes to the repair of various sizes and pitches of gears in limited quantities, the automatic feature becomes even a hindrance. Furthermore,

the greater capacity between centers of the dividing head on the milling machine allows the mounting of more gear blanks at one setting than on the gear cutter. In either case the cutter outfit is the same. The gear cutter is limited to operations on spur gears, or, at best, to spur and bevel gears, while the milling machine has capacity for both of these, and for spiral and worm gears as well.

The only type of automatic gear cutting machine capable of also cutting spiral and worm gears is known as a hobbing machine, and its price is at least the equal of the milling machine. The dividing head equipment on the milling machine provides a range in divisions for teeth, &c., which these gentlemen tell me has covered every job that has come within their practice.

The milling machine has still another great advantage over the gear cutter in that it has such wonderful range of work in addition to gear cutting. The automatic gear cutter is by its nature limited to that work alone, but with gear cutting the usefulness of a milling machine has only begun. As stated, the main use of a milling machine is in the repair, or manufacture, of various styles of small gears about cotton machinery, and even in this alone it is a better investment than an ordinary gear cutter. It is also valuable in cutting key seats in shafts of any medium length, such as loom shafts, and cuts such a key seat in one operation, and one cut in probably one-quarter of the time taken by a planer or shaper with single cutting tool. There are many small brackets, such as those for carrying the axle bearings of the drums carrying the thread and cloth in the various processes of weaving. These brackets must be faced for rigid attachment to the machine, and as they are comparatively frail and exposed to breakage through constant handling of this material, they must frequently be replaced. The preparation of these is the simplest kind of work for a milling machine.

There are other lines of work for the milling machine. One of these mills is making its own reamers for the holes through gears cheaper than they can buy them, and as these holes are of varying sizes, a wide assortment of reamers is necessary, and the saving therefore considerable. The milling machine is also capable of making twist drills and milling cutters, but this is advisable only where ample hardening and tempering facilities are provided. I am also informed of an instance where a mill received an assignment of bolsters which came unslotted and the expense and delay of returning these were saved by the milling machine they had, which handled the job in the easiest kind of way.

It would seem, therefore, that the installation of a good milling machine is economically advisable, even necessary, to the cotton mill. In fact, both of these mills informed me that they certainly could not do without the machine after having installed and profited by its universal uses. I am not informed as to the prices charged by the manufacturers of cotton machinery or by the jobbing shops for the replacement of such parts as mentioned above, but am confident that a milling machine on which all this is possible would pay for itself in comparatively short time, besides the advantage of having it at hand for immediate service when delay through ordering outside would be serious.

This letter is published not merely to indicate how well the milling machine is adapted to the requirements of cotton mills, but for the purpose of demonstrating the sort of intelligent investigation into the requirements of textile mills which might profitably be conducted in other lines of machine tool practice. It is possible that inquiries into conditions in other manufacturing industries might yield fruitful results.

Canadian Manufacturers and Municipal Equipment Orders.

Canadian manufacturers are experiencing some of the bitter fruit which so often follows the careful planting of what are expected to be enjoyable crops. They encouraged in every way the formation of the Hydro-Electric Power Commission in Ontario in the belief that the great development of Niagara electric power for the purpose of furnishing Ontario municipalities with the current would redound to the advantage of local industries in supplying equipment, machinery and all kinds of accessories essential for putting the power into use.

It is now found that the municipalities, instead of favoring Canadian manufacturers with their orders for the equipment of the distribution plants, are sending their orders to England. Thus Guelph is getting its motors from Manchester; the Ontario city of London has purchased in England the pumps that are to be operated in its water works by power from the Hydro-Electric Commission's lines, and Toronto is advertising in outside countries for the pumps that are to be installed in connection with its municipal distribution plant. Applications for specifications as to the last named are coming in so fast that the City Engineer's office finds difficulty in meeting the demand.

One Ontario manufacturer of such equipment says that at present the outlook is that all the machinery for the electrical distribution plants in the municipalities leagued together for power purchases will be purchased from manufacturers outside of the country. As these municipalities are looking to local manufacturers to buy the power distributed by the public plants, the Canadian interests have thought it would seem more businesslike to give the home makers the preference for equipment. The towns and cities in the league are competing with one another, and with other towns and cities to attract manufacturers to their respective centers of distribution, and it is felt that it would be politic to get all the equipment from domestic manufacturers if they can furnish what is required at reasonable prices. Manufacturing concerns that are preparing to introduce electricity as the motive power for their works are, however, more partial to domestic producers of the machinery required for the change, and are therefore placing most of their orders at home. The Hydro-Electric Commission itself gave its contracts for machinery, equipment, wire,. &c., as far as possible to home makers.

The outcry of the Canadian manufacturers is justifiable to some extent. It always seems indefensible for buyers of any kind of machinery or supplies to overlook nearby sources. This applies generally, whether in Canada or elsewhere. The home manufacturer should at least be given a chance to show what he can do.

The International Steel Tie Company.—The Day steel concrete railroad tie, designed and patented by William P. Day, is to be manufactured by the International Steel Tie Company, Altoona, Pa., which has been incorporated under the laws of Delaware, with an authorized capital stock of $2,000,000. The tie is composed of twin steel I beams, 8 ft. in length, set about 20 in. apart, and held together by broad bed plates filled with concrete. Mr. Day, who has had long experience in Cleveland in the fabrication of steel, has given much time for the past 10 years to the development of a steel tie, on which he has secured 11 patents. For several months samples of the Day tie have been manufactured for the parties interested, and pieces of track on a number of railroads have been laid, which are stated to have demonstrated the success of the design and construction. The company will purchase the steel beams from the manufacturers and assemble the parts in a plant to be erected at Altoona. The cost is said to be about the same as that of a wooden tie. The incorporators of the company are William P. Day and V. A. Oswald of Altoona, John J. O'Donnell of Cleveland, Ohio, and Harry Emmons of Dover, Del. Offices have been secured in the Central Trust Building, Altoona.

About $500,000 is being expended by the National Lead Company, Chicago, in the erection of new buildings and their equipments. The plans, which were drawn by Architect W. L. Stebbins, Monadnock Block, Chicago, provide for the erection of a power house, 53 x 110 ft.; warehouse and experimental department, 85 x 170 ft.; office building, 50 x 70 ft.; also 60 corroding stacks, 175 x 360 ft. It is stated that all of the equipment required has been arranged for. The same architect has also drawn plans for a foundry, 100 x 190 ft., to be erected by the Johnson & Jennings Company, Chicago. The equipment for this has also been purchased.

OBITUARY.

JAMES W. BROWN.

James W. Brown, president of the Colonial Steel Company, Pittsburgh, died suddenly October 23 at a shooting club in Michigan from a complication of heart trouble and pneumonia, aged 65 years. He was a native of Pittsburgh, and was educated in local schools. In 1860 he entered the employment of Bailey, Brown & Co., iron manufacturers, his father, William R., being a member of the firm. After an extended experience

JAMES W. BROWN.

as a traveling salesman he formed a partnership in 1874 with Rodman Wister as brokers in ore and pig iron. In 1876 he became connected with Hussey, Howe & Co., Ltd., and was shortly afterward elected treasurer, holding that office until 1888, when the company became Howe, Brown & Co., Ltd., with Mr. Brown as its president. In this capacity he served until the merger into the Crucible Steel Company of America, of which he was made vice-president and general sales agent. In 1901 he organized the Colonial Steel Company, becoming its president. He served a term as member of Congress in 1903-5, refusing all other political honors. He had also attained eminence in the Masonic fraternity in his State, having been Grand Master of Masons of Pennsylvania in 1904-5. He leaves a widow and five children. His sons are Charles M. and Thomas M. H., both residing in Pittsburgh.

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THOMAS J. HAYWARD, Baltimore, Md., died October 23, aged 62 years. He was born in Baltimore, where his father was engaged in the manufacture of stoves. On the completion of an academical course he served as an apprentice in the stove foundry. On the death of his father the firm name was changed to the Bartlett-Robbins Company. In 1880 Mr. Hayward purchased the interest of Mr. Robbins, the firm name was changed to Bartlett, Hayward & Co., and the business was greatly extended, taking in the manufacture of machinery. In 1905, on the death of Mr. Bartlett, Mr. Hayward purchased that interest, thus becoming the sole proprietor. His trade became so extended that he established an office in New York City. In May of this year the business was incorporated under the name of the Bartlett-Hayward Company. At the time of his death Mr. Hayward was president of that company and held large interests in other manufacturing enterprises. He was also a director of the Farmers & Merchants National Bank, the Western National Bank and the Eutaw Savings Bank. He took a leading part in the organization of many of the prominent financial and industrial corporations of Baltimore, and was noteworthy for his disposition to assist others in time of distress. He was a member of the Reorganization Committee of the Seaboard Air Line. It is stated of Mr. Hayward that he was probably personally acquainted with a larger number of those who served under him than any other employer in the country. The employees of the foundry and machine shops of the Bartlett-Hayward Company number 2500, so that this claim has some significance. He leaves a widow, two sons and two daughters.

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PIERCE N. WELCH, New Haven, Conn., for many years identified with the metal industry, died suddenly in Berlin, Germany, October 26, aged 68 years. At the time of his death he was president of the Bristol Brass Company and vice-president of the Bristol Mfg. Company, Bristol, Conn., and a director of the New Haven Clock Company. In 1870 he became president of the New Haven Rolling Mill Company and held the office for 20 years. He was a native of Plainville, Conn., passed his boyhood in New Haven, and graduated from Yale University in 1862. He began his business career as a partner in a wholesale grocery house in New York. He gave to Yale the fine dormitory known as Welch Hall, and has contributed generously to philanthropic enterprises. He leaves a widow, four daughters and one son, Pierce Noble Welch, Jr., who is treasurer of Peck Bros. & Co., New Haven.

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L. A. CRANDALL, manager of sales in the Middle West for the J. W. Paxson Company, Philadelphia, died at his home in Toledo, Ohio, October 17. Mr. Crandall had been connected with foundry supply houses for 25 years and was one of the best known salesmen in that trade. For a number of years his headquarters were at Detroit.

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EDMUND HENDRICKS of Hendricks Brothers, New York, manufacturers of copper and dealers in metals, died October 27, aged 75 years.

International Congress of Mining and Metallurgy.

The next international congress of mining, metallurgy, applied mechanics and practical geology will be held in the last week in June, 1910, at Düsseldorf, Germany under the auspices of the Rhenish-Westphalian mining industry. This appointment is in pursuance of the action taken by the last international congress, which was held in Liege, Belgium, in 1905. The programme for the metallurgical section is included under six heads, as follows: A, Production of Pig Iron; B, Production of Malleable Iron; C, Iron and Steel Manufacture; D, Testing of Iron and Other Metals; E, Economics of the Iron Industry; F, Advances in the Metallurgy of Non-Ferrous Metals. In this section of applied mechanics topics will be considered relating to machinery used for mining and metallurgical purposes. Included among these are the subjects of blowing engines for blast furnaces and steel works, methods of driving rolling mills, central electric power stations, rolling mills and accessories, and conveyors for mining and smelting work.

The work of the congress will be taken up in general and sectional meetings, and there will be visits to scientific institutions and industrial works. Inquiries for information should be addressed to the Committee of Organization of the International Congress, 3-5 Jacobistrasse, Düsseldorf, Germany. There are two presidents and two secretaries of the congress, representing respectively mining and metallurgy. For the latter Friedrich Springorum is president and E. Schrödter, secretary. They are president and secretary, respectively, of the Verein Deutscher Eisenhüttenleute.

The American Rolling Mill Company, operating an open hearth plant and sheet mills at Middletown, Ohio, and a sheet mill at Zanesville, Ohio, will this week receive bids on the equipment desired for an entirely new plant, which includes a 40-in. blooming mill, one 24-in. billet and bar mill, 16 30-in. sheet mills, the necessary boilers, open hearth furnaces, heating furnaces, &c. Work will be commenced as soon as a site is chosen. Zanesville, Middletown, Ashtabula and several other localities are under consideration. The company has already ordered from the Mesta Machine Company a 55 x 60 in. reversing engine to drive the blooming mill.

PERSONAL.

Jason Paige, lately with the American Bridge Company of New York as contracting agent of its Chicago office, is now contracting engineer of the Lackawanna Bridge Company, making fabricated bridge material, having his headquarters in room 579, 50 Church street, New York.

Nisbet Latta, who has acquired international fame as an authority on combustion engineering, recently became identified with the Allis-Chalmers Company as engineer of the gas and mill engine department at the West Allis Works.

R. S. de Mitkiewicz, until recently gas power expert for the Fairbanks Company, New York, has accepted a similar position in the sales department of the Alden Sampson Mfg. Company, with headquarters in New York.

Andrew Carnegie arrived in New York from Europe October 31.

Dr. Richard Moldenke, Watchung, N. J., secretary of the American Foundrymen's Association, who attended the Copenhagen meeting of the International Society for Testing Materials in September, returned home last week. His European tour began in Christiana and ended in Naples, taking in points in Germany, France and Italy.

H. L. Hanson, formerly connected with the sales department of the Columbia Steel Company, Elyria, Ohio, has taken a position with the pig iron firm of David Evans & Co., Chicago.

D. B. Meacham of Rogers, Brown & Co., Cincinnati, Ohio, has returned from a three months' European trip.

Thomas P. Schwanger, night superintendent of the Carpenter Steel Works at Reading, Pa., has been appointed superintendent of the Cardenas Iron Works at Cardenas, Cuba.

Milton O. Knauss has been made superintendent of the Empire Steel & Iron Company's furnace at Macungie, Pa.

Luther Frazier, formerly with the Republic Iron & Steel Company, with headquarters at Birmingham, Ala., is now connected with the sales department of the Southern Iron & Steel Company and is located at its Birmingham office.

George F. McKay, traffic manager of the Lackawanna Steel Company, has resigned. His successor is W. E. Howes, who has been assistant traffic manager. The change is effective November 15.

The Bigsby Mfg. Company Organized.—The Bigsby Mfg. Company, Cleveland, Ohio, has been organized to engage in the manufacture of iron and steel roofing, eaves trough, conductor pipe and some minor lines. The company will also carry on a jobbing business in tin plate and various tinners' supplies. The company has leased the building on Perkins avenue, formerly occupied by the Garford automobile plant, which is being fitted up with the necessary machinery equipment, and the company will place the plant in operation in a few days. The building is 50 x 255 ft., three stories. Its location adjoining the tracks of the Pennsylvania Railroad gives the company admirable shipping facilities. The Bigsby Company is capitalized at $100,000. Its president is C. S. Bigsby, until recently vice-president of the Garry Iron & Steel Company, Cleveland, with which company he had been associated 15 years. Bernard Bigsby is secretary and sales manager; he was formerly secretary of the Garry Company, with which he had been connected for the past nine years. A. W. Henn of the National-Acme Mfg. Company is vice-president and treasurer.

A company known as the Canadian Factories, Ltd., has been formed by the merger of the E. N. Heney Company, Montreal, the Tuhope Carriage Company, Orilla, Ont.; the Canada Carriage Company, Brockville, Ont., and Monroe & Macintosh of Alexandria, Ont. The object on the part of these companies in combining forces is for the purpose of standardizing their output and to cut out some lines that have not been profitable.

The Demand for Steel in Canada.

TORONTO, October 30, 1909.—Construction of all kinds is going forward in Canada at nearly as hurried a pace as that in which it was stopped by the money stringency of 1907. Railroad building is not in quite so great a state of activity as it was then, but the number of hands engaged in new construction is large. The Canadian Northern is preparing to fill the gaps in its transcontinental system. A land subsidy was obtained from the Ontario Government for the building between Sudbury and Port Arthur. For the extreme western section of the line—that is, for the 600-mile section from the Yellowhead Pass in the Rocky Mountains to Vancouver on the coast—an arrangement has been made with the British Columbia Government. That Government undertakes to guarantee interest on the company's bonds at 4 per cent. per annum on an issue of $35,000 per mile, the company being required to have the section completed in two years. The Government is now appealing to the country largely on the strength of this scheme of railroad policy. The arrangement is similar to that entered into last year by the Government of Saskatchewan, and by the Government of Alberta for aiding the construction of branch lines of the Grand Trunk Pacific and of the Canadian Northern in these Provinces. In the British Columbia arrangement the Canadian Northern also undertakes for a bond guarantee to build a railroad across the rich island of Vancouver. D. D. Mann, one of the chiefs in the Canadian Northern, stated at Victoria recently that if steel works are not established in Vancouver Island before this railroad is built, he himself will establish them.

As to the putting up of new buildings in Canada, the change for the better has been extremely marked for some time, and the demand for builders' hardware has been good. A distinguishing feature of the new building campaign is the striking increase in large structures for office and factory purposes. The demand for steel in such buildings is exceptionally large. Other work, such as the building of bridges, the building of transmission lines, &c., calls for large quantities of steel. Contractors all through Ontario are finding themselves hampered by the backwardness of steel deliveries on structural account. Many builders who have large Government and railroad contracts are fearing that the delay in their operations because of the tardy delivery of steel will prevent the completion of their contracts within the time specified. Inquiries for steel for Canadian contracts are being sent to England.

G. A. Harris, Canadian Trade Commissioner in Japan, reports to the Department of Trade and Commerce at Ottawa that the next Japanese budget will provide for an expenditure of $20,000,000 on Government railroads, and he expresses the opinion that if Canadian steel companies would send representatives to Japan they could get a share of the business. C. A. C. J.

Aluminum Coated Sheets in a Coal Tipple.—Aluminum coated sheets in corrugated form, made by the Wilder Metal Coating & Mfg. Company, Connellsville, Pa., have been specified for the new coal tipple of the Isabella-Connellsville Coke Company, at Arensburg, Pa., The sheets made by this process were adopted after an exhaustive investigation by George S. Baton & Co., civil and mining engineers, Pittsburgh. The company advises us that it was found that the sheets were impervious to weather and atmospheric conditions around coking plants. The metal was placed in running mine water, together with copper. The sulphur water left only a shadow of the copper, while the aluminum coated sheet was not apparently injured. Several years ago pipe was thus coated and placed in a Connellsville mine where the sulphur water was the strongest, and after years of service it was found to be in perfect condition, having outlived three black pipes and apparently in condition to last again as long. It is recommended by the Wilder Metal Coating & Mfg. Company that the metal be not painted, unless painting is desired, and it gives a guarantee of 10 years' service without showing any signs of corrosion.

The National Metal Trades Association.

The semiannual meeting of the Administrative Council of the National Metal Trades Association was held at the offices of the association in Cleveland, October 27. Those present were as follows: President, Howard P. Eells, Cleveland; First Vice-President J. H. Schwacke, Philadelphia; Second Vice-President H. W. Hoyt, Detroit; Treasurer William Lodge, Cincinnati; Commissioner Robert Wuest, Cleveland, and the following councillors: M. K. Bowman, New York City; F. C. Caldwell, Chicago; Paul B Kendig, Seneca Falls, N. Y.; L. H. Kittredge, Cleveland; W. A. Layman, St. Louis; B. B. Quillen, Cincinnati; R. D. Reed, Westfield, Mass.; Herbert Rice, Cincinnati; E. P. Robinson, Boston, Mass., and Henry D. Sharpe, Providence, R. I.

The reports of the officers for the past six months were read and brought forth much favorable comment. A large portion of the meeting was devoted to a discussion of various methods of education, especially in reference to apprentices and the "handy man."

President Eells entertained the members at luncheon at the select suburban club, the Roadside Club.

In the evening the members were the guests of the Cleveland branch at their fall meeting and banquet at the Athletic Club. W. C. Bruce, vice-president of the Cleveland branch, presided, and short speeches were made by President Eells, Commissioner Wuest and other members of the Administrative Council. Considerable interest was taken in the portion of the report of Philip Frankel, secretary of the Cleveland branch, that referred to apprentices. He stated that the Metal Trades' Superintendents' and Foremens' Club of Cleveland had taken up the question of apprentices and was trying to evolve some method to make more mechanics, and to prevent apprentices from going from one shop to another; or, in other words, to make an apprentice serve his entire time in the shop in which he starts. He said that the club had appointed a committee on apprentices to meet with a similar committee from the Cleveland branch, and that the two committees working together hoped to devise some satisfactory plan for the solution of the apprenticeship problem before the winter is over.

At the meeting of the Administrative Council the report of Treasurer William Lodge was found especially gratifying. It showed an increase of 20 per cent. in cash on hand for the half year and a decrease in the disbursements for the same period of 27 per cent. The decrease in office expenses, amounting to 32 per cent., elicited favorable comment. The decrease in membership of the association, in spite of the extremely adverse conditions which prevailed since the last convention, amounted to only five members.

New York City was chosen as the place and April 12 and 13 as the date for the association's next annual meeting, which will be held at the Hotel Astor. It will be preceded by the annual meeting of the Administrative Council.

The matter of increasing the defense fund was discussed at some length, and the opinion was expressed that, while this fund at the present time is in excellent condition, it might be well to make arrangements tending toward its increase, in view of the possibility of large expenditures on account of the labor difficulties which the association might be called on to combat in the coming year.

The monthly *Bulletin* issued by the association, which will be sent out this week, contains some interesting figures showing the steady revival of business in plants operated by the members, as follows:

The number of operatives employed in the shops of our members June 15, 1907, is used as a basis from which to figure, because on that date there was employed the largest number in the history of our organization up to that time. From a glance at the figures given below it would seem that to-day we have about reached the normal in the employment of operatives. This table shows the quarterly increases and decreases in the number of operatives employed in the shops of members, using a percentage basis and taking the operatives employed June 15, 1907, as 100 per cent.:

Quarter.	Per cent.	Quarter.	Per cent.
June 15, 1907	100	September 15, 1908	62
September 15, 1907	94	December 15, 1908	64
December 15, 1907	89	March 15, 1909	68
March 15, 1908	72	June 15, 1909	74
June 15, 1908	65	September 15, 1909	79

Canadian Industrial News.

The National Iron Works Company.

The National Iron Works Company, whose agreement with the municipal corporation of Toronto to obtain a site on Ashbridge's Marsh was opposed by the issue of an injunction at the instance of a Toronto ratepayer, has full confidence apparently that the agreement will be sustained in the courts. At all events, it has put in a successful tender for 1080 lengths of pipe for the installation of a water system in new districts of the city. The contract will contain a clause providing for a penalty in the event of the company failing to complete delivery within the time specified. This undertaking is regarded as another indication of the good faith of the company, which has steadily maintained that it would at once establish its works, unless prevented from doing so by obstructive legal proceedings. As Cawthra Mulock, who is at the head of the company, is one of Toronto's richest men, financial difficulties are not likely to be experienced.

Plumbers' Enameled Ware Industries.

The Standard Sanitary Mfg. Company of Pittsburgh has arranged with the Commissioner of Industries in Toronto to establish a plant in this city. The company proposes to employ between 400 and 500 hands in its Toronto works, upon which it is expected to expend in the first five years not less than $3,000,000. As a field for the operations of a large concern engaged in the manufacture and sale of enameled and other plumbing goods, Canada is particularly attractive. In all parts of the country the construction of dwelling houses is proceeding at a rapid rate, and this is likely to continue with only occasional interruptions for many years to come. Competition for the Canadian market has been active for some time, and to get on a better footing for the trade the Standard Sanitary Mfg. Company began casting about for a location in this country. Hamilton, Welland and Montreal all offered inducements, but Toronto appears to have been preferred.

Another development attributed to the stress of competition among the sellers of both tubs, sinks, &c., in Canada is the merging of two Canadian companies engaged in the manufacture of these and like articles. The Port Hope Standard Ideal Company and the Amherst Foundry Company, the former an Ontario concern, and the latter a Nova Scotia enterprise, have been brought together in a $2,000,000 merger. The two companies employ about 850 hands. The Port Hope plant, which is now working day and night, is to be modernized, and the work of the two plants is to be economized by specializing.

A Sydney Contract for Toronto.

A large contract for constructive and equipment work has been given by the Dominion Iron & Steel Company, Sydney, N. S., to the Canada Foundry Company, Toronto. An additional blast furnace is to be built by the former, its Bessemer plant is to be extended, and two open hearth furnaces of the new type are to be put up. The Canadian Foundry Company's part in the creation of all this new plant is valued at $500,000. Besides these works, the Sydney company is to build an additional rod mill, two merchant bar mills, and is reported to have a plate mill ready to set up upon the announcement of the Government shipbuilding policy that is expected.

The National Rolling Mills project put forward in Sydney some time ago appears to be making progress. A number of prominent men connected with it have lately been conferring. C. A. C. J.

The Forged Steel Wheel Company, an identified interest of the Standard Steel Car Company, Pittsburgh, has received an order for 28,000 steel wheels for new cars to be built by the Chesapeake & Ohio Railroad.

The Pennsylvania Railroad Company's Electric Locomotives.

Each Will Develop 4000 Horsepower.

The first of the electric locomotives to be used in the New York tunnel extension of the Pennsylvania Railroad has been received in Long Island City. It was brought to New York from the company's Altoona shops for the purpose of making tests over the electrified lines of the Long Island Railroad. When work was first started on the Pennsylvania tunnels and station the engineers of the railroad company, co-operating with those of the Westinghouse Electric & Mfg. Company, took up the problem of designing an electric locomotive which would cope successfully with the heavy grades necessary in the river tunnels. Since then electric locomotives have been designed, constructed and tested, and special recording track sections have been laid and electrified. Much electrical apparatus has been built and voluminous reports and records were compiled before the completion of the locomotive above referred to, which is No. 3998.

The first 24 electric locomotives to be built for service in these tunnels will be assembled in the Pennsylvania Railroad shops at Altoona, Pa. The electric apparatus will be built at the East Pittsburgh shops of the Westinghouse Electric & Mfg. Company, while the mechanical features will be made in the railroad's locomotive shops. The locomotives will have the following dimensions:

Total weight, net tons	166
Weight of electrical parts, tons	62
Weight of mechanical parts, tons	103
Total horsepower	4,000
Maximum draw bar pull, pounds	60,000
Maximum speed	60 to 70 miles per hour under load
Diameter of drive wheels, inches	68
Diameter of truck wheels, inches	36
Weight on drivers, tons	14
Mechanical shock without injury, pounds	600,000
Length over all, feet	65
Total wheel base, feet	56

Details of Construction.

The Pennsylvania type locomotive is built in two sections; that is, there are two cabs and two running gears, jointed at the middle. Each section has eight wheels, four of which are drivers, the other four being truck wheels, constituting in their arrangement and weight distribution what in steam locomotives is called the American type.

The sections are permanently coupled back to back by a distinctive arrangement of Westinghouse friction draft gear and levers, so that the leading section effectually pilots the rear one. This obviates all necessity of turning the engine, as it runs equally well in either direction, and all manipulating levers are duplicated in each section, so that the operative simply changes ends.

Two pairs of drive wheels are coupled, not to the customary cross head and pistons, but to a crank shaft, called a jack shaft, in line with the driver axles, which in turn is coupled to a motor crank shaft, to which a single motor delivers all its power. The cranks are 90 degrees apart, so that there can be no "on-center" position. The motor crank revolves uniformly and at constant effort, differing therein from steam practice, and, while the pressures on the connecting pins and rods vary throughout each revolution, the turning effort of the drive wheels is the same as for the motor, constant throughout each revolution.

Distinctive from steam practice, all rods and moving parts have pure rotation only, and are thus counterbalanced for all speeds, thereby delivering no more shock to the track and roadbed than a passenger car of equal weight.

New Features.

The motor and massive side frames, jack shaft and all other gear are spring supported from the driver and truck wheels, so that there is no track stress other than that local to a single pair of wheels. In this arrangement of motor support and connection the center of gravity hight closely approximates that in the best high-speed locomotives.

Earlier types of electric locomotives do not possess these features, the purpose of which is to utilize on the drive wheels directly the naturally continuous rotation of the electric motor. Of these there have been several examples, on a type with small drive wheels to secure an admirable electrical condition, others with spring supported motors influenced by mechanical condition, both of which were classed high-speed types; and then for lower speeds, influenced by both electrical and mechanical conditions, the geared type, similar but larger than the common trolley motors.

A decided improvement in the Pennsylvania type is the use of a single motor for two pairs of drivers, and the benefits secured by its position. The motor is located high up from the roadbed, secure from snow, dirt and water, and space limitations are largely removed. In its design it possesses electrical features never before secured on an electric locomotive.

The Largest Railroad Motor Ever Constructed.

The single motor weighs, without gear, 45,000 lb., and in weight and power it is the largest railroad motor ever constructed. It projects into the cab and, in fact, fills a large part of it.

The main control apparatus is in a bulkhead sort of an arrangement centrally located, so that there are ample passageways along the sides. At one end is located the electrically driven air compressor for operating the air brakes.

In the operating end of the locomotive there is a Westinghouse brake valve for high-speed brake operation, and also the engineer's controller, by which all electrical manipulation is secured. These correspond to the throttle and reverse lever on a steam locomotive. The controller is scarcely as large as that on a Hoe printing press. None of the main power passes through it, as it is really a switch corresponding to a telegrapher's key, operated by electro-pneumatic means. With a lever which can be moved with one finger, the engineer can admit to the locomotive a current equal to that available in 100 trolley cars.

The electric supply will be secured from an electric conductor, or third rail, by four contact shoes on each locomotive. At some points, where the great number of track switches will not permit this, power will be secured from an overhead conductor through an air-operated overhead contact shoe, of which there are two on each locomotive.

The new locomotive is of steel construction throughout, and each section has the usual bell, sand box and whistle. The latter is blown by air.

Tariff Information Requested.

The United States Tariff Board, Treasury Department, Washington, D. C., is asking for information from manufacturers and merchants to assist in determining the application of the maximum and minimum rates of the new tariff and to develop the discriminations, if any, against American exporters by the tariffs of other countries. It is necessary for the proper fulfillment of its purpose that the Tariff Board should have full information not only as to the formal legislation or regulations of foreign countries in this regard, but also as to the practical workings of any such laws or regulations in their effect on American export trade. The board desires and asks for the co-operation of the business interests of the country, and invites communications containing definite and explicit statements of fact as to the actual bearing of foreign tariffs or regulations on the trade of American exporters as compared with the exporters of other countries. All such communications will receive prompt and careful consideration.

The National Roll & Foundry Company, Farmers' Bank Building, Pittsburgh, works at Avonmore, Pa., has made an advance to card list of ¼ cent per pound on rolls for delivery in 1910.

Pig Iron Production.

A Remarkable Output in October.

The Present Rate Is More Than 31,000,000 Tons a Year.

The pig iron statistics for October show an astonishing increase over September, surprising as was the record for the latter month. Almost complete returns show that the output last month of coke and anthracite iron was 2,592,516 gross tons. There was a net gain of 10 in the number of active furnaces, or from 299 October 1 to 309 November 1.

Daily Rate of Production.

The daily rate of production of coke and anthracite pig iron by months, beginning with October, 1908, is as follows:

Daily Rate of Pig Iron Production by Months.—Gross Tons.

	Steel works.	Merchant.	Total.
October, 1908	32,217	18,337	50,554
November	32,705	19,890	52,595
December	35,172	20,986	56,158
January, 1909	35,983	21,992	57,975
February	38,367	22,609	60,976
March	36,811	22,421	59,232
April	36,436	21,526	57,962
May	40,531	20,222	60,753
June	45,507	19,149	64,656
July	48,670	19,123	67,793
August	51,354	21,192	72,546
September	55,361	24,146	79,507
October	56,973	26,656	83,629

Production of Steel Companies.

Returns from all plants of the United States Steel Corporation and the various independent steel companies show the following totals of product month by month. Only steel making iron is included in these figures, together with ferromanganese, spiegeleisen and ferrosilicon. These last are stated separately but are included in the first three columns of "total production."

Production of Steel Companies.—Gross Tons.

	Pig.—Total production.—			Spiegeleisen and ferromanganese.	
	1907.	1908.	1909.	1908.	1909.
January	1,406,397	664,415	1,117,823	20,254	12,325
February	1,317,923	745,802	1,073,363	9,402	10,046
March	1,424,827	841,502	1,140,553	13,750	23,743
April	1,446,788	725,548	1,093,092	12,363	22,478
May	1,470,080	759,674	1,256,448	17,823	20,834
June	1,457,230	717,689	1,365,527	15,958	16,516
July	1,452,557	798,639	1,508,762	10,250	17,613
August	1,445,685	897,052	1,591,991	14,932	22,313
September	1,417,153	933,514	1,660,839	8,938	28,148
October	1,514,521	996,481	1,766,162	12,174	25,384
November	1,084,114	981,167	.....	15,882	....
December	659,459	1,090,339	.....	6,510	....

October Product by Districts.

The table below gives the production of all coke and anthracite furnaces in October and the four months preceding:

Monthly Pig Iron Production.—Gross Tons.

	June. (30 days)	July. (31 days)	August. (31 days)	Sept. (30 days)	Oct. (31 days)
New York	123,792	152,249	173,317	176,777	181,143
New Jersey	18,590	19,002	22,765	29,703	33,256
Lehigh Valley	52,464	55,646	58,607	62,332	68,339
Schuylkill Val.	46,004	47,323	48,105	52,234	56,312
Lower Susquehanna and Lebanon Val.	52,361	50,738	54,713	69,252	77,009
Pittsburgh Dis.	479,362	524,102	538,294	548,968	594,652
Shenango Val.	110,004	128,251	143,722	154,614	164,564
West. Penn.	112,975	118,904	118,174	125,712	142,036
Md., Va. and Kentucky	54,448	52,551	67,752	64,652	74,327
Wheeling Dis.	94,664	111,620	125,281	126,077	139,832
Mahoning Val.	175,949	196,593	207,887	211,979	220,093
Central and North. Ohio	135,319	148,969	153,797	187,366	213,585
Hocking Valley, Hanging Rock and S.W. Ohio	32,908	26,872	26,804	30,628	39,921
Mich., Minn., Mo., Wis., Colo.	59,187	57,008	61,980	62,601	68,561
Chicago Dis.	263,126	287,106	282,668	300,261	316,673
Alabama	101,280	106,482	139,131	154,353	170,716
Tennessee, Georgia and Texas	18,433	20,015	23,483	27,697	31,497
Totals	1,930,866	2,103,431	2,248,930	2,385,206	2,592,516

Capacity in Blast November 1 and October 1.

The following table shows the weekly capacity of furnaces in blast November 1 and October 1, the furnaces blown in in October being rated on the records of previous performance:

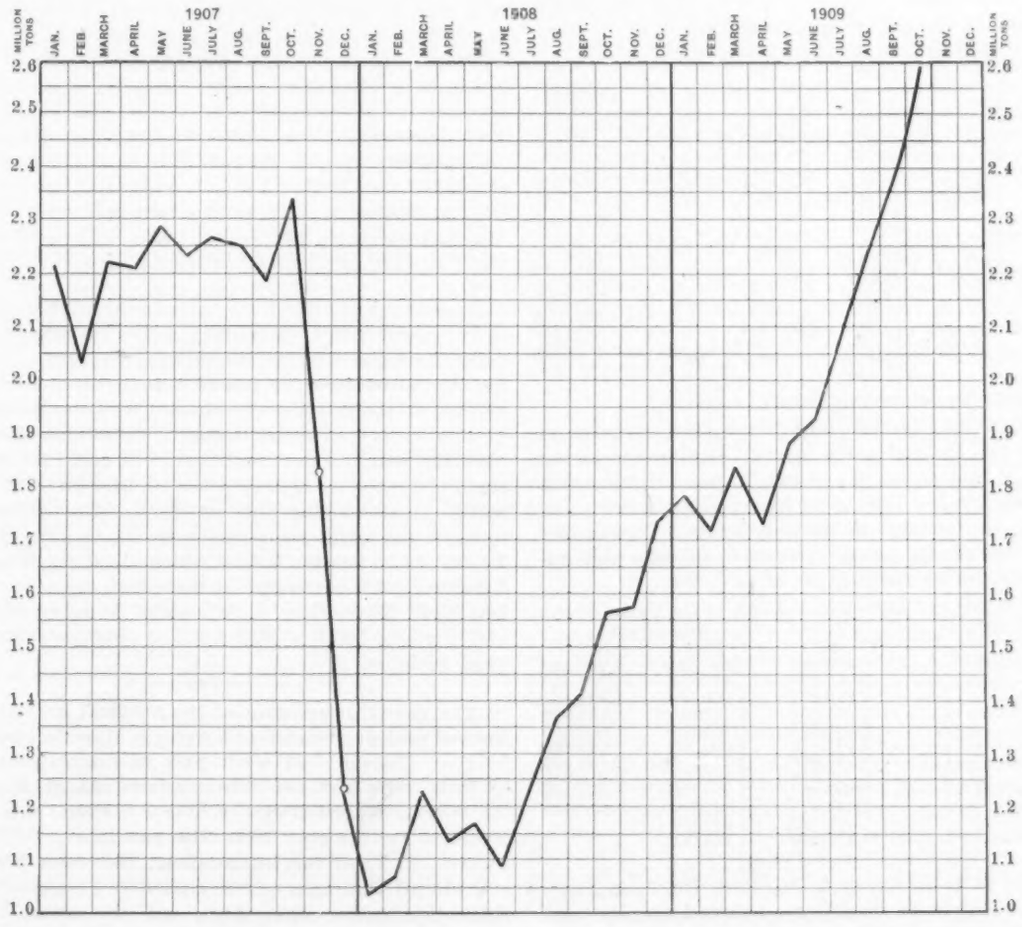


Diagram of Coke and Anthracite Pig Iron Production in the United States in 1907, 1908 and 1909.

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks.	November 1. Number in blast.	November 1. Capacity per week.	October 1. Number in blast.	October 1. Capacity per week.
New York:					
Buffalo	16	16	37,268	16	37,461
Other New York	7	3	3,884	3	3,642
New Jersey	8	5	7,815	5	7,234
Spiegel	2	0	0	0	0
Pennsylvania:					
Lehigh Valley	25	16	15,432	16	14,840
Spiegel	3	2	720	2	721
Schuylkill Valley	15	9	12,345	9	12,387
Low. Susquehanna	7	6	9,520	6	8,958
Spiegel	1	1	590	1	576
Lebanon Valley	10	8	8,399	7	6,853
Pittsburgh Dist.	47	48	132,036	46	125,580
Spiegel	2	2	2,240	3	2,955
Shenango Valley	20	18	37,160	18	36,078
West. Penn	27	19	32,073	17	28,833
Maryland	4	3	6,210	4	8,042
Wheeling Dist.	14	13	33,577	12	29,414
Ohio:					
Mahoning Valley	20	20	52,415	20	51,631
Cent. and Northern.	21	19	48,229	19	46,635
Hocking Val., Hanging Rock and S. W. Ohio	15	11	9,155	9	7,096
Illinois and Indiana	28	23	68,110	24	67,431
Spiegel	3	2	2,156	3	2,313
Michigan, Wisconsin and Minnesota	9	6	6,681	7	7,953
Colorado and Missouri	7	4	7,879	4	6,829
The South:					
Virginia	23	11	8,533	9	6,438
Kentucky	5	2	2,002	1	714
Alabama	46	28	39,835	27	38,226
Tennessee	18	11	7,924	10	6,341
Georgia and Texas.	4	3	1,420	1	425
Totals	408	309	593,608	299	565,606

Among the furnaces blown in in October were one Wharton in New Jersey, Keystone in the Schuylkill Valley, one Carrie in the Pittsburgh district, one Cambria and Nittany in western Pennsylvania, Low Moor, West End and Radford Crane in Virginia, Norton in Kentucky, Belmont in the Wheeling district, Union in the Hanging Rock region, one Gadsden in Alabama, and Jefferson and Sam Lanham in Texas.

Among furnaces made idle in the month were one Oxford in New Jersey (banked), one Swede in the Schuylkill Valley, Pulaski in Virginia, one Maryland Steel at Sparrows Point, one Calumet and one Federal in the Chicago district, one Mayville in Wisconsin and Hannah in the Mahoning Valley.

A Record of Active Capacity.

The active weekly capacity in coke and anthracite iron has shown the following fluctuations since January 1, 1907, the figures representing gross tons:

	Capacity per week.		Capacity per week.
November 1, 1909	593,608	May 1	268,674
October 1	565,606	April 1	264,890
September 1	525,037	March 1	267,437
August 1	488,742	February 1	241,925
July 1	463,029	January 1, 1908	235,152
June 1	446,096	December 1, 1907	347,372
May 1	412,010	November 1	491,436
April 1	409,217	October 1	511,397
March 1	420,807	September 1	507,768
February 1	414,497	August 1	513,471
January 1, 1909	401,994	July 1	528,170
December 1, 1908	381,102	June 1	523,220
November 1	362,685	May 1	524,538
October 1	337,925	April 1	496,456
September 1	313,112	March 1	511,035
August 1	284,590	February 1	492,359
July 1	264,452	January 1, 1907	507,397
June 1	259,284		

The Curve of Pig Iron Production.

The spectacular performance of the blast furnaces in September and October gives especial significance to the curve of pig iron production shown in the accompanying chart. The line has now gone to far the highest point reached in the history of the iron trade. The figures plotted in the chart, giving production of coke and anthracite pig iron by months, are as mollows:

Production of Coke and Anthracite Pig Iron in the United States by Months in 1907, 1908 *and* 1909.—*Gross Tons.*

	1907.	1908.	1909.
January	2,205,607	1,045,250	1,797,560
February	2,045,068	1,077,740	1,707,340
March	2,226,457	1,228,204	1,832,194
April	2,216,558	1,149,602	1,738,877
May	2,295,505	1,165,688	1,883,330
June	2,234,575	1,092,131	1,930,866
July	2,255,660	1,218,129	2,103,431
August	2,250,410	1,359,831	2,248,930
September	2,183,487	1,418,998	2,385,206
October	2,336,972	1,567,198	2,592,516
November	1,828,125	1,577,854	.....
December	1,234,279	1,740,912	.....

The firm of L. A. Green & Co., Park Building, Pittsburgh, Pa., dealers in machinery, railroad supplies and contractors' equipment, has been incorporated as the L. A. Green Company, with a capital of $10,000.

The Electrochemical Society's Meeting.

One of the most, if not the most, successful meetings of the American Electrochemical Society was the sixteenth general meeting, held in New York City October 28, 29 and 30. The papers presented on Thursday, October 28, were particularly of interest to chemists and electrochemists. On Saturday there were presented a number of papers for metallurgists, a list of which was given in our last issue. While those having to do with electric furnaces were of general interest to users of such apparatus, their principal appeal was to designers, inasmuch as they were concerned with technical features of construction, dealing, for example, with the cause of electrode losses, and these losses in relation to furnace efficiency. The increased attention which is being given to this subject will be of immeasurable benefit to the art as the greatest obstacle at present in the way of a successful electric furnace is the difficulty of obtaining satisfactory electrodes.

The usual extensive preparations were made for the entertainment of the society's members and guests. On Friday the entire day was given to excursions to industries in and around Bayonne, N. J. A special train, starting from Jersey City on the Central Railroad of New Jersey, went first to Constable Hook, where the forenoon was spent in inspecting parts of the Standard Oil Company's plant, which were of particular interest to the members, as well as the National Sulphur Company's sulphur refining works and the Pacific Coast Borax Company's plant for the manufacture of borax and boric acid. The Gröndal briquetting plant at the General Chemical Company's works was also visited. This is the first American installation of the Gröndal process. After lunch at a resort on the Kill Von Kull, where the Mayor of Bayonne welcomed the society, the party visited the Babcock & Wilcox Company's plant, and was shown the various steps in the manufacture of water tube boilers. Following this the party proceeded to the Electro-Dynamic Company and saw the building of variable speed Interpole motors, and also the Electric Launch Company, where submarine vessels, launches, &c., are built, and the Industrial Oxygen Company's demonstrating plant, where this company's acetylene and oxygen generators were shown and the use of the oxy-acetylene torch in welding and cutting metals. A special train brought the excursionists back to the city in time to attend the subscription dinner at the Hotel Cumberland. On Saturday evening the society was entertained with a smoker at the Chemists' Club. With the exception of the dinner, nothing in the regular programme appealed to the ladies, consequently special provisions were made for their entertainment, such as automobile trips and theatre parties.

Important as are all the branches of work represented in the membership, the society makes no mistake in devoting so much attention to electrometallurgy. Although one of the youngest of the arts, to-day it is destined to become of the greatest prominence, and the co-operation in this society of metallurgists with mining, hydraulic, electrical and chemical engineers, will make for the most rapid advances, as each field has its part directly or indirectly in developing the industry. The society was founded only eight years ago, with 350 charter members. To-day it has nearly 1100, of which about 180 are foreign members, but it is the quality more than the quantity that has made this society so influential in so short a time and promises for it a distinguished position among technical societies.

The annual convention of the National Association of Agricultural Implement and Vehicle Manufacturers was held at Chicago last week and was largely attended by both active and associate members. H. M. Kinney of the Winona Wagon Company, Winona, Minn., was elected president for the year 1909-1910, and Edwin D. Metcalf, Auburn, N. Y., of the International Harvester Company, was elected chairman of the Executive Committee. The convention lasted three days, and the social features included a theater party, a ball and a banquet on successive evenings.

NEWS OF THE WORKS.

Iron and Steel.

The weekly output of the Central Iron & Steel Company's plant at Harrisburg, Pa., is nearly up to the record of 3600 tons several years ago.

Perry Forge at Marysville, Pa., has been put in operation on double turn on orders for blooms from Philadelphia and Washington. It has work ahead for several months.

The North Anderson, Ind., plant of the American Sheet & Tin Plate Company is being dismantled and the machinery taken to another plant at Sharon, Pa. It was built about 15 years ago and has been idle the last five years.

The new open hearth steel furnace of the Sharon Steel Hoop Company, at Sharon, Pa., was put in operation last week.

General Machinery.

The Leader Foundry & Machine Company, Quincy, Ill., which recently consolidated the business of the Sharpe & Becker Machine Company, has begun the construction of a new plant, 96 x 100 ft., into which the machinery from the old plant of the latter company will be installed. Besides doing a general foundry and machine business, the company will hereafter make a specialty of power presses and dies, sheet metal working tools and special machinery.

The Milwaukee Reliance Boiler Company, Milwaukee, Wis., is having plans drawn for a machine shop, two stories, 80 x 100 ft.

The Koehring Machine Company, Germania Building, Milwaukee, Wis., has awarded the contract for the erection of a one-story machine shop, 160 x 200 ft., the estimated cost of which is $40,000.

A horizontal pumping engine of 2,000,000 gal. capacity will be bought by the city of Parkersburg, W. Va.

The Seager Engine Works, Lansing, Mich., is improving the equipment of its plant, in consequence of the amount of business in hand, and will install additional motors.

A line of direct current motors for operating machinery will be installed by the Lufkin Rule Company, Saginaw, Mich., in its new shop.

B. D. Tillinghast, McDonald, Pa., has completed plans for a new machine shop, 50 x 100 ft., with a wing, 16 x 32 ft., which will be built of brick and steel, with a cement floor. It will be ready for occupancy early in the spring, when Mr. Tillinghast will move his present equipment into the new building.

The Chase Tool Mfg. Company has been incorporated at Minneapolis, Minn., by Wm. B. Chase and others, to manufacture machine shop equipment. A plant will be leased for the present.

A new plant, requiring crushing, grinding, mixing and pressure machinery, will be erected in March or April by the Streator Clay Mfg. Company, Streator, Ill., power to be supplied from an existing plant.

New pulverizing machinery, kettles and power equipment will be required shortly by the Pacific Coast Gypsum Company, Tacoma, Wash., for an extension of its works.

A report from Johannesburg, S. A., states that Herbert Ainsworth, the proprietor of an agency dealing in machinery, has recently made heavy sales of American apparatus for installation in all parts of lower Africa, indicating the approach of great industrial activity throughout that region.

W. J. Lott, Junction City, Kan., is in the market for crushing, elevating and screening machinery.

The Vulcan Iron Works Company, a new corporation, has taken over the plant of the Vulcan Iron Works, Mason City, Iowa, and is entering upon an extensive remodeling, including the purchase of improved machinery.

Pumping machinery will be purchased in December for the water works authorized for construction at Grandfield, Okla.

Engines, generators, motors, exhaust fans, sprinkling systems and tools for woodworking, sharpening and repairs will be needed by the large number of planing mills, box factories, &c., about to be erected, including those of Johnson & Co., Ravenna, Ohio; C. C. Clark, Marion, Mich.; Maydell (Texas) Planing Mill Company; Frank E. Anderson, St. Croix Falls, near Osceola, Wis.; Kurtz-Downey Company, Ashland, Wis.; Lang & Crist Box & Lumber Company, Clarksburg, W. Va.; Wm. A. Berkey Company, Grand Rapids, Mich., and Louisville (Ky.) Furniture Mfg. Company.

The Moline (Ill.) Tool Company will double its present capacity by the erection of a large addition. Equipment details are now being worked out.

A large horizontal blowing engine, to operate on blast furnace gas, will be installed by the Pennsylvania Steel Company, Steelton, Pa.

A 500-ton concentration mill, with auxiliary machinery, will be erected by the Butte & Superior Copper Company, Ltd., Butte, Mont.

Two crushing plants, with breakers of the largest size ever constructed, having a 42-in. opening, will be erected by the Casparis Stone Company at Havre de Grace., and Patterson Creek, W. Va. The machinery is being built by the Gates Iron Works, Chicago. These plants will furnish ballast for regrading the entire line of the Baltimore & Ohio Railroad between Washington and Pittsburgh.

Two 20-25 ton open hearth furnaces, for which contract has been placed, will be installed by the Irondale Steel Company at Port Townsend, Wash. Some additional equipment, including electric motors, will be purchased later. A gas engine and dynamo are among the probabilities of future requirements.

The Coronado Mining Company, Congress, Ariz., is reported to be in the market for a 20-stamp crushing plant, concentrating machinery and cyanide mill. The main office is at Dubuque, Iowa.

Smith, Emery & Co., engineers, San Francisco, are drawing plans for a cement mill to be erected by the Arrowhead Portland Cement Company at Etiwanda, Cal. Machinery for a capacity of 1000 bbl. daily will be required, and it is proposed to install a turbine power plant similar to that recently completed by the Golden State Portland Cement Company.

An engine, generator, motors, air compressor and ore reduction machinery will be needed by the Arizona Empire Copper Mines Company, Parker, Ariz.

A new machine shop, with modern equipment, will be erected by the Clarage Foundry & Machine Company, Kalamazoo, Mich. Lathes, planer, milling machines and grinders are among the company's probable requirements.

A large steam pump, steel ventilating fan and concentrating machinery will be purchased by S. C. Phillips, Globe, Ariz., for the mines of which he is superintendent.

A modern plant, with power presses, engine house, grinding, mixing, screening and other machinery, is to be built by J. C. Steele & Sons, Statesville, S. C.

One or more electric motors will be purchased by the Trion Mfg. Company, Trion, Ga.

The Automobile Roller Bearing Company has completed plans for large new works to be erected at Goshen, Ind., the machinery requirements of which will be considerable.

Alternating current motors of special construction will be purchased by the Toltec Portland Cement Company, Tula, Mexico, to drive all the machinery in its works, consisting of a heavy crusher, ball mills, tube mills, kilns, &c.

The Sweet & Doyle Valve Company, Green Island, N. Y., has changed its name to the Sweet & Doyle Foundry & Machine Company.

A crushing plant, consisting of gyratory breaker with chilled iron grinding head, revolving trommel, elevator, &c., will be erected by the Dark Canyon Stone Company, Rapid City, S. D.

The Millers Falls Company, Millers Falls, Mass., is arranging to build an addition, 60 x 100 ft., which will be used for providing more room for its automatic screw machine department.

The Stauft Coke Machinery Company, with a capital of $10,000, has been incorporated to handle the coke drawing and leveling machine which is the invention of D. B. Stauft of Uniontown, Pa. Mr. Stauft, who is connected with the Taylor Coal & Coke Company, Uniontown, Pa., is treasurer of the new company.

The Pittsburgh office of the Aldrich Pump Company, Allentown, Pa., has sold to the Republic Iron & Steel Company, for installation in its new tube mill at Haselton, Ohio, two vertical quintuplex pumps with capacity of 200 gal. per min., against a pressure of 1000 lb. The pumps will be operated by 150 hp. motors, direct connected, and will be utilized in the operation of hydraulic shears and punches.

The National Bolt & Foundry Company, Pittsburgh, with plant at Avonmore, Pa., has received an order from the Southern Iron & Steel Company, Gadsden, Ala., which calls for a run-out roller table. The company reports considerable activity in its roll business, and it is furnishing miscellaneous sized rolls to various makers of large rolls.

The machine tool department of the Fairbanks Company, Pittsburgh, which is handling a line of lathes and other tools made by the Pittsburgh Machine Tool Company, has recently secured orders for special tools made by this company as follows: A 48-in. lathe for the Hyde Park Foundry & Machine Company, Hyde Park, Pa.; a 48-in. lathe on a 17-ft. bed for the Goodyear Rubber Company, Akron, Ohio; a 42-in. lathe on a 17-ft. bed and a 28-in. lathe on a 30-ft. bed for the Adamson Machine Company, Akron.

Foundries.

Barr & Creelman, Rochester, N. Y., have ordered a heavy duty Corliss engine for the Co-operative Foundry Company.

The Michigan Malleable Iron Company, Detroit, Mich., whose shipping rooms, annealing room and machine shop were recently damaged by fire, announces that it is again ready to start the plant at full force. The loss is estimated at approximately $100,000.

The Wheeling Mold & Foundry Company, Wheeling, W. Va., has started up a new 25-ton open hearth furnace, which has just

been added to its plant. The new furnace will enable the company to furnish a general line of steel castings as well as iron and steel rolls and chilled and sand rolls.

The Lawrence Iron & Steel Foundry Company, formerly the Yagle Foundry & Machine Company, Pittsburgh, has awarded a contract to George Naismith & Son for the construction of a 15-ton open hearth furnace. The contract calls for the work to be completed and the furnace in operation by January 1, at which time the company will add the manufacture of steel castings to its line of foundry work.

The Keystone Bronze Company, Thirty-ninth street and Allegheny Valley Railroad, Pittsburgh, manufacturer of bronze, brass and copper castings, is operating its plant full capacity on blast furnace, open hearth and miscellaneous mill work. A contract recently completed covered a number of open hearth water cooled port castings, weighing 5000 lb., the plant of this company being fully equipped to turn out large work.

Power Plant Equipment.

O. L. Bear, Pittsburgh agent for the Linton Machine Company, New York, has recently taken contracts for feed water heaters and purifiers as follows: Pittsburgh & Lake Erie Railroad Company, 1350-hp. horizontal combination heater and purifier for installation in the power house at the Pittsburgh depot; Bayless Pulp & Paper Company, Austin, Pa.; 1200-hp. horizontal heater; Winding Gulf Colliers Company, Mullins, W. Va., 1200-hp. vertical heater.

F. G. Borden, Pittsburgh agent of the Russell Engine Company, Massillon, Ohio, has recently made sales of steam engines and other equipment as follows: Ambridge Electric Light Company, Ambridge, Pa., complete equipment, including concrete block building, 60 x 140 ft., 400 hp. Russell engine, and two 150-kw. generators; Andrews & Hitchcock, Hubbard, Ohio, 300-hp. engine direct connected to generator for supplying light and power at furnace plant; Union Drawn Steel Company, Beaver Falls, Pa., 300-hp. engine direct connected to 150-kw. generator; Pittsburgh-Gilmore Railway Company, Armstead, Mont., complete power house equipment, including two boilers, two engines, generators, pumps and heaters; Tower Hill-Connellsville Coke Company, Uniontown, Pa., 75-hp. engine for mine work.

Some auxiliary power house apparatus will be purchased this month by the Northern Cambria Street Railway Company, Spangler, Pa.

A new plant is to be built by the Mountain State Electrical Company, Wheeling, W. Va.

A generating unit of 175 to 200 kw. will be installed in the power plant of the Dalhart Ice & Electric Company, Dalhart, Texas.

H. Deino, Kingsville, Texas, will be in the market shortly for an engine, dynamo and other electrical machinery.

M. P. Stamm, Albuquerque, N. M., has had plans prepared for an electric power house and will operate under a franchise granted by the city.

Extensive improvements are to be made in the municipal lighting station at Martinsville, Va., and a steam turbine unit may be ordered.

The capacity of the Citizens Light & Power Company, Lenoir, N. C., will be increased and new power machinery is to be contracted for in the near future.

Three hydro-electric power plants are to be built in Feather River by a company of which H. O. Logue, Oroville, Cal., is manager.

A new generating unit of 300 hp. will be installed in the power house of the American Seeding Machine Company, Springfield, Ohio.

Machinery for municipal power and lighting stations will be needed at Reedsville, N. C.; Beach, N. D.; Nanton, Alberta, and Sterling, Neb., if plans now under consideration by the local authorities are matured.

Andrews, N. C., will build a municipal pumping plant, according to the plans of J. B. McCrary & Co., Atlanta, Ga. For machinery specifications address them.

An electric power plant and pumping station will be constructed in the near future at Lemon, Colo.

Additional power machinery, including generating set of 800 hp. and a large line of motors for both direct and alternating current, will be installed this winter in the new strawboard mill of the Watab Pulp & Paper Company, Sartell, Minn.

The erection of a new power plant is planned by the Garavanza Mining & Milling Company, Leastalk, Cal.

New electric generating machinery, including an engine or turbine, will be purchased in the near future by the Citizens' Light & Power Company, Lenoir, N. C.

The Pere Marquette Light & Power Company, Hart, Mich., will build a hydro-electric plant, work upon which is to be started in the spring.

George T. Ladd, Farmers' Bank Building, Pittsburgh, has sold a 40 x 40 in. heavy duty horizontal Corliss-Bass engine to the Republic Iron & Steel Company. The engine will be installed in the Mahoning Valley Works, Youngstown, Ohio, to operate an 18-in. mill.

Gas engines have been decided upon as prime movers for the pumping station planned for Reservoir Park at Harrisburg, Pa.

An electric power plant and concentrating mill will be erected by the Five Bears Mining Company, Genessee, Cal.

The Sherman (Texas) Gas, Light & Fuel Company has decided upon the building of a new power plant of about 1000 kw. capacity. A steam turbine may be purchased.

Two steam turbines of 1000 hp. each, with exciters, condensers and motors for operating machinery in the planing mill, will be added to the power equipment of the Panhandle Company, Spirit Lake, Idaho.

Power plant machinery, pumps and other apparatus will be required for a new factory, 44 x 125 ft., which the Excelsior Shoe Company is to build at Ironton, Ohio.

Two oil filled, water cooled transformers, having an aggregate capacity of 1000 kw., will be placed in the power plant substation of the Burges Sulphite Fibre Company, Berlin, N. H.

A high speed engine and dynamo for municipal lighting service have been purchased at Nashwauk, Minn., and a new pumping plant is to be erected later.

A. G. Ludwig, Arlington, Neb., will be in the market shortly for steam boilers, having been granted franchise for a heat distributing system.

The Kees Mfg. Company, Beatrice, Neb., will be in the market this winter for power machinery, having decided upon building a new factory.

The factory of the Robinson-Norton Company, New Albany, Ind., will be completely rebuilt and special attention has been devoted to planning the power equipment.

At Gilbert, Minn., the municipal pumping plant is to be enlarged and a new engine unit installed.

Electric light and power plants for municipal service are under consideration at Towner, N. D.; Lacombe, Alta.; Enderlin, N. D.; Mulhall, Okla.; King City, Mo., and Defiance, Ohio.

Machinery for an electric generating station, pumping plant and other municipal works will be needed this winter at Wenoka, Okla., where a large issue of bonds has been authorized.

A power station equipped with turbines will be built for 10,000 hp. capacity at Riverton, Kan., by the Empire Electrical Power Company.

A new boiler is needed for the municipal pumping station at Doylestown, Pa., and some additional equipment may be installed later.

Construction of a pumping plant, municipally operated, is being planned at Conway, Ark.

The Holton Power Company, Redlands, Cal., has decided to install generating, transforming and driving machinery of large capacity, including a hydraulic turbine unit of 1000 hp.

A hydraulic power station and compressor plant will be erected at Dorieska, Cal., by the Dorieska Mining Company.

The central station at White Bear, Minn., has been acquired by H. M. Byllesby & Co., Chicago, and the electrical machinery will be extensively remodeled.

The Lluvia de Oro Mining Company, Chihuahua, Mexico, which recently installed a steam turbine of American build in competition with European designs, has ordered from the same manufacturers a hydro-electric unit for the water power which it proposes to develop.

The building of a municipal power station and installation of electrically driven pumps is proposed at Nickerson, Kan.

A steam boiler of 100 to 150 hp. will be installed by the Newbury Mining Company, Price, Ariz.

A hydraulic turbine and generator will be added to the plant of the Otter Tail Power Company, Fergus Falls, Minn.

A horizontal cross compound pumping engine, with condenser, is required for the municipal water works at Lancaster, Ohio.

An electric power plant is to be built by the Stoddard Mines Company, Stoddard, Ariz.

R. W. Oswald, Pittsburgh, representative of the Atlas Engine Works, Indianapolis, Ind., has made the following sales: Beaver Clay Mfg. Company, New Galilee, Pa., 100-hp. boiler; Atlanta Coal Company, Boswell, Pa., 150-hp. boiler; Hocking Coal Company, Meyersdale, Pa., 150-hp. boiler; H. C. Frick Coke Company, Pittsburgh, 150-hp. boiler, and engines to the following companies: American Window Glass Company, Pittsburgh; Henry Swank Company, Johnstown, Pa., and a manufacturing company in Chambersburg, Pa.

Murray & Rogers, Farmers' Bank Building, Pittsburgh, have sold 1200 hp. of S. Freeman & Sons' water tube boilers, to be installed in the Windy Gulf Collieries Company's plant at Mullen, W. Va.

Kanawha, Okla., will expend $30,000 in the construction of a pumping plant, electric generating station and other equipment for a municipal water and lighting system. Bids are to be taken at once.

A gasoline engine to cost not more than $1800 will be bought for the city water works, at Red Wing, Minn.

Plans for a pumping plant at Prosser, Wash., to be used in connection with the proposed water and sewage system, have progressed to the stage where the machinery specifications will be considered shortly.

The Riverside Water Company, Sisterville, W. Va., will expend about $80,000 in improvements, including the purchase of additional power and pumping machinery.

Plans are being made by the Heber (Ark.) Light & Power Company for an electric generating station to supply current for municipal lighting, commercial use and the operation of a street railroad.

One or more steam turbine generating units will probably be purchased in the spring by the Cedar Rapids & Iowa City Railway & Light Company, which has had plans prepared for the construction of interurban lines radiating in three directions from Cedar Rapids, Iowa.

Two or three step-up transformers of large capacity will be needed this winter by the Snohomish Electric Company, Snohomish, Wash.

The Western Light & Power Company, recently incorporated at Washougal, Wash., for $50,000, will erect a new plant with electric dynamos of considerable capacity. The type of prime mover to be used is not stated.

Tools for metal and wood working are to be purchased this fall by the Nilson Yacht Building Company, Baltimore, Md., with possibly electric motors, for a new plant.

Bridges and Buildings.

W. N. Kratzer & Co., structural fabricators, Pittsburgh, are operating their plant double turn. They have contracts for the construction of a bridge at Morehead City, N. C.; structural material for dams No. 8, Ohio River; No. 1, Monongahela River, and lock No. 6, Ouichata River, Ark.; steel tipples and power houses complete for the Ford Collieries Company, Detroit; at works Nos. 1 and 2, Culmervills, Pa.; a steel frame building for the Griswold Mfg. Company, Erie, Pa.; structural steel store building for the Pittsburgh-Buffalo Company, Marianna, Pa., and the steel work for the high school building, Wilkinsburg, Pa.

The Brunswick-Balke-Collender Company, manufacturer of billiard tables and furniture, will establish a refrigerator plant at Elkhart, Ind.

Miscellaneous.

The Jones Dishwasher Company has been ogranized at Hammond, Ind., and incorporated with $10,000 capital stock to manufacture dishwashers. Th edirectors are Thos. E. Jones, Chas. P. Arnold and J. Floyd Irish.

New electric traction lines are projected by the Davenport, Iowa City & Western Traction Company, Davenport, Iowa; Pueblo & San Luis Valley Railroad & Power Company, Pueblo, Colo.; Waterville Railway Company, Douglas, Wash.; Central Florida Traction Company, Orlando, Fla.; Astoria, Seaside & Tillamook Railway Company, Astoria, Ore.; Mexico, Santa Fé & Perry Electric Railway, Mexico, Mo.; Red Oak & Northeastern Railway, Red Oak, Iowa; Fostoria & Fremont Railway Company, Fostoria, Ohio; Coos Bay Electric Railway Company, Marshfield, Ore.; Center County Traction Company, Harrisburg, Pa.; Sioux City & Spirit Lake Railway Company, Sioux City, Iowa; Decatur Belt Railway, Decatur, Ill.; South Dakota Interurban Railway, Centerville, S. D.; Lawton & Ft. Sill Electric Railway, Lawton, Okla.

Among the machinery requirements at Cobalt, Ont., where considerable equipment will be contracted for this winter, is a 20-stamp crushing plant to be erected oy the Nova Scotia Cobalt Mining Company.

Reconstruction of the water works station at McKeesport, Pa., with installation of modern high duty pumping machinery at least equal in economy to the engines used by the steel mills, is being considered by the authorities.

D. Lanyon, Iola, Kan., has had plans prepared for cement works at Bartlesville, Okla. Machinery specifications will be in the hands of the Hunt Engineering Company.

A new smelting furnace is among the requirements of the Culver Baer Mining Company, Geysers, Cal.

Gas producers of large capacity will be built by the Tri-City Railway & Light Company, Moline, Ill., and it is reported that they may be utilized for driving gas engines to be installed in the electric power plant as well as for illumination.

New pumping plants for water and sewage are under consideration at Renton, Wash.; Ellensburg, Wash.; Sentinel, Okla.; Verden, Okla.; Hagerman, N. M.; Albemarle, N. C.; Plankinton, S. D.; Waxahachie, Texas; Anson, Texas; Madill, Okla.; Greensville, Ga.; Kenesaw, Neb.; Carbon Hill, Ala.; Weston, Ont.; Riverside, Cal. (Jurupa Water Company) and Antlers, Okla.

A Williams pulverizer has been purchased by the Cia Manufacturera de Cemento Portland, City of Mexico.

Two new 60-ton open hearth furnaces will be added to the plant of the Inland Steel Company at Indiana Harbor, and will be ready for operation in April, 1910. This will add about 35 per cent. to the ingot capacity of the works. It was found that the production of steel was not equal to the mill capacity and the open hearth furnaces are added to equalize operations. The new sheet mills which are now under construction will be ready for operation soon after the first of the year.

Labor Notes.

The National Labor Tribune, published at Pittsburgh, and which was formerly the official organ of the Amalgamated Association, printed an editorial last week advising the Executive Board of the Amalgamated Association that it should call off the strike in the tin plate and sheet mills of the American Sheet & Tin Plate Company. The article states that the men have hopelessly lost the strike and are only adding to their sufferings and privations of the last four months by continuing it.

The Standard Chain Company, Pittsburgh, has posted notices in its works at Rankin, Pa., that, commencing November 1, the employees will receive a 5 per cent. increase in wages, to be followed by another 5 per cent. increase January 1.

The Pittsburgh & Lake Erie Railroad has voluntarily increased the wages of its laborers from $1.50 to $1.65 per day, effective November 1.

The District Court of Appeals, Washington, D. C., on November 2 affirmed the jail sentences passed by Justice Wright on Samuel Gompers, John Mitchell and Frank Morrison, officers of the American Federation of Labor. The officers of the federation had refused to obey the order of the Supreme Court of the District of Columbia restraining them from boycotting the Buck's Stove & Range Company of St. Louis. The sentences imposed were: Gompers to serve one year, Mitchell to serve nine months and Morrison to serve six months. There is some doubt whether the defendants can take an appeal to the United States Supreme Court. Pending a settlement of the question they will be at liberty on the bond given when the appeal was taken.

The Hamilton Iron & Steel Company.—The reorganization of this company is now complete, save for the retirement of George L. Pearson as president in favor of Frank L. Perin of Cincinnati, and the possible entrée of a representative of an interest in the porthern part of the State as a member of the board. This will occur on Saturday. At a meeting last Monday board members R. W. Neff, N. S. Keith and O. V. Parrish resigned and Frank L. Perin, J. C. Thoms and F. L. Garrison were elected to succeed them. R. A. Field retires as secretary-treasurer and E. C. Seimer was elected secretary and H. L. Brenneman treasurer. The Otto coke interests through this rearrangement become important in the management. E. M. Peters, secretary and assistant treasurer of the United Iron & Steel Company, becomes general manager and will have charge of operations.

Milliken Bros.' Reorganization.—Owing to the great complications in which the affairs of Milliken Bros., Inc., are involved, the Committee of Reorganization is making slow progress in carrying out the plan and agreement made public last June. The propositions thus far made for the acquisition of the property have not been acceptable to all interests. Meantime as the fabricating plant has not been taking new business and as old business has been practically worked off, it is working with a small force, and notice has been posted that it will close down December 1.

The report that the Allegheny Steel Company, Pittsburgh, operating an open hearth steel plant and plate, sheet and tube mills at Brackenridge, Pa., would add more open hearth steel furnaces and sheet mills to its plant is officially denied. No improvements or additions are under way or contemplated at present. The company is operating its entire plant to full capacity in all departments and may possibly build one open hearth furnace next spring, but a definite decision about this has not been reached.

The Iron and Metal Trades

Following the remarkable record of September, the performance of the blast furnaces of the country in October is amazing and points to a consumption of iron and steel greater than has been appreciated. Practically complete figures to *The Iron Age* on the third day after the close of the month show a production of coke and anthracite iron in October of 2,592,516 gross tons, against 2,385,206 tons in September. The steel companies produced 1,766,162 tons in October, or 56,973 tons a day, against a daily average of 55,361 tons in September. The merchant furnaces increased their daily rate of 24,146 tons in September to 26,656 tons last month.

It thus appears that pig iron production last month, allowing 35,000 tons for charcoal iron, was at the rate of close to 31,000,000 tons a year. Whereas at the beginning of October the active weekly capacity was 565,606 tons for 299 furnaces, we entered November with 309 coke and anthracite furnaces in blast having a weekly capacity of 593,608 tons, or at the rate of 31,400,000 tons a year, allowing for charcoal iron.

The United States Steel Corporation blast furnaces and steel works far exceed their best records in October. The total of blast furnace products was 1,218,758 tons, an increase of 64,388 tons over the September record, while the ingot production was 1,398,052, an increase of 95,978 tons.

Along with the record performances of all steel mills is to be noted the continued heavy booking of orders by the steel companies. This condition has led to the buying of further lots of steel making pig iron. In the Central West a total of 43,000 tons has been taken at $19, Valley furnace. One company bought 40,000 tons, of which half is for this year's delivery and the remainder in the first four months of 1910. Another steel company is in the market for Bessemer iron for this year. Some further sales of basic iron have been made in eastern Pennsylvania at $19 for the first quarter. The recent purchases of basic iron by two important steel foundry interests are now reported to have been fully 50,000 tons.

Foundry iron markets are quieter, though buying keeps up and prices are firm on all grades. The largest transaction of the week was the purchase of 36,000 tons of iron by a Central Western pipe interest for the first half of 1910. Virginia furnaces took 12,000 tons of this.

The large orders for rolling stock placed by several railroads last week and the pending business of this character assure full winter employment to a variety of interests. Steel foundries are very busy in filling requirements of locomotive works.

The rail orders announced by the New York Central as amounting to 165,000 tons have not yet been formally allotted to the mills. A minor portion will be open hearth rails. It is understood that a considerable additional tonnage of Bessemer and open hearth rails will be required by the Vanderbilt lines for 1910.

While new structural work is light the prospects are that large bridge orders will be placed for 1910. The American Bridge Company, through better deliveries by the mills, has been able to put its Ambridge plant on double turn for the first time in two years.

A general advance in sheet prices is looked for, and some independent interests are already quoting higher. The repeated advances in spelter have brought the cost of galvanized sheets quite above the level fixed by the ordinary spread between black and galvanized sheets and the lack of adjustment is causing some confusion. There is a probability also of an advance in iron pipe.

Old material is reported weaker in all markets.

The large sales of copper to consuming interests, reported in the past week, while evidently made at concessions, have resulted in a firmer market.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Nov. 3, 1909.	Oct. 27, 1909.	Oct. 6, 1909.	Nov. 4, 1908.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	**$19.00**	$19.00	$18.50	$16.75
Foundry No. 2, Southern, Cincinnati	17.75	17.75	17.75	15.75
Foundry No. 2, local, Chicago	19.00	19.00	19.00	16.85
Basic, delivered, eastern Pa.	**19.00**	19.00	18.00	16.00
Basic, Valley furnace	**17.25**	17.00	16.75	13.90
Bessemer, Pittsburgh	**19.90**	19.90	18.90	15.65
Gray forge, Pittsburgh	**17.15**	17.15	16.90	14.40
Lake Superior charcoal, Chicago	19.50	19.50	19.50	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	**27.00**	27.00	25.00	25.00
Forging billets, Pittsburgh	**30.00**	30.00	29.00	27.00
Open hearth billets, Philadelphia	**30.60**	28.60	27.60	26.20
Wire rods, Pittsburgh	**32.00**	32.00	31.50	33.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	*17.25*	17.25	17.75	14.50
Steel rails, melting, Philadelphia	18.00	18.00	18.00	15.25
Iron rails, Chicago	20.50	20.50	20.50	18.00
Iron rails, Philadelphia	21.00	21.00	21.00	19.75
Car wheels, Chicago	18.50	18.25	18.50	15.25
Car wheels, Philadelphia	17.50	17.50	17.50	15.00
Heavy steel scrap, Pittsburgh	*17.50*	18.00	17.75	15.50
Heavy steel scrap, Chicago	*16.00*	16.00	16.75	15.00
Heavy steel scrap, Philadelphia	18.00	18.00	18.00	15.25
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	**1.62**	1.60	1.57	1.45
Common iron bars, Chicago	**1.55**	1.55	1.50	1.50
Common iron bars, Pittsburgh	**1.60**	1.65	1.55	1.40
Steel bars, tidewater, New York	1.66	1.66	1.66	1.56
Steel bars, Pittsburgh	1.50	1.50	1.50	1.40
Tank plates, tidewater, New York	1.66	1.66	1.66	1.76
Tank plates, Pittsburgh	1.50	1.50	1.50	1.60
Beams, tidewater, New York	1.66	1.66	1.66	1.76
Beams, Pittsburgh	1.50	1.50	1.50	1.60
Angles, tidewater, New York	1.66	1.66	1.66	1.76
Angles, Pittsburgh	1.50	1.50	1.50	1.60
Skelp, grooved steel, Pittsburgh	1.45	1.45	1.45	1.45
Skelp, sheared steel, Pittsburgh	1.55	1.55	1.55	1.50
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.30	2.30	2.30	2.50
Wire nails, Pittsburgh*	1.80	1.80	1.80	1.95
Cut nails, Pittsburgh	1.80	1.80	1.80	1.75
Barb wire, galv., Pittsburgh*	2.10	2.10	2.10	2.40
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	*13.25*	13.25	13.50	14.00
Electrolytic copper, New York	*12.87½*	12.87½	13.00	13.75
Spelter, New York	**6.30**	6.30	5.90	4.90
Spelter, St. Louis	**6.10**	6.10	5.75	4.80
Lead, New York	**4.40**	4.40	4.38	4.35
Lead, St. Louis	425	425	4.25	4.30
Tin, New York	*30.40*	30.50	30.50	30.37½
Antimony, Hallett, New York	*8.25*	8.25	8.30	8.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	$3.74	$3.74	$3.74	$3.89

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel F.O.B. Pittsburgh.

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Shapes.—I-beams and channels, 3 to 15 in., inclusive, 1.50c., net; I-beams over 15 in., 1.60c., net; H-beams over 8 in., 1.70c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.55c., net; angles, over 6 in., 1.60c., net; angles, 3 x 3 in. and up, less than ¼ in., 1.70c., base, half extras, steel bar card; tees, 3 in. and up, 1.60c., net; zees, 3 in. and up, 1.55c., net; angles, channels and tees, under 3 in., 1.45c., base, plus 10c., half extras, steel bar card; deck beams and bulb angles, 1.75c., net; hand rail tees, 2.75c., net; checkered and corrugated plates, 2.75c., net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.50c. to 1.60c., base. Extras over this price are as follows:

Tank, ship and bridge quality, ¼-in. thick on edges, 100 in. wide, down to but not including 6 in. wide, is taken as base.

Steel plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, shall be considered ¼-in. plate. Steel plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Steel plates over 72 in. wide, ordered less than 11 lb. per square foot down to the weight of 3-16-in. shall take the place of 3-16-in.

Percentages as to overweight on plates, whether ordered to gauge or weight, to be governed by the Association of American Steel Manufacturers' Standard Specifications.

Gauges under ¼-in. to and including 3-16-in. plates on thin edges	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
All sketches (excepting straight taper plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete circles	.20
Boiler and flange steel plates	.10
"A. B. M. A." and ordinary firebox steel plates	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Shell grade of steel is abandoned.	
For widths over 100 in. up to 110 in.	.05
For widths over 110 in. up to 115 in.	.10
For widths over 115 in. up to 120 in.	.15
For widths over 120 in. up to 125 in.	.25
For widths over 125 in. up to 130 in.	.50
For widths over 130 in.	1.00

TERMS.—Net cash 30 days. Pacific Coast base, 1.30c. f.o.b. Pittsburgh.

Sheets.—Minimum prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, 1.65c.; Nos. 9 and 10, 1.70c.; Nos. 11 and 12, 1.75c.; Nos. 13 and 14, 1.80c.; Nos. 15 and 16, 1.90c.; box annealed sheets, Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c.; No. 29, 2.35c.; No. 30, 2.45c.; galvanized sheets, Nos. 13 and 14, 2.35c.; Nos. 15 and 16, 2.45c.; Nos. 17 to 21, 2.60c.; Nos. 22 to 24, 2.75c.; Nos. 25 and 26, 2.95c.; No. 27, 3.15c.; No. 28, 3.35c.; No. 29, 3.45c.; No. 30, 3.70c. Painted roofing sheets, No. 28, $1.60 per square. Galvanized roofing sheets, No. 28, $2.85 per square for 2½-in. corrugations.

Wrought Pipe.—Discounts on steel pipe, ¾ to 6 in., in carloads to the largest trade, are 80 and 5 per cent. off list, and on iron pipe, ¾ to 6 in., are 75 and 5 per cent. off list.

Boiler Tubes.—Regular discounts, effective from October 1, 1909, on steel and charcoal iron boiler tubes, are as follows:

	Steel.	Iron.
1 to 1½ in.	49	43
1¾ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 3 in.	69	55
6 to 13 in.	61	43

2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.

Wire Rods.—Bessemer, open hearth and chain rods, $32.

Steel Rivets.—Structural rivets, 2.05c., base; boiler rivets, 2.15c., base, subject to usual extras.

Chicago.

FISHER BUILDING, November 3, 1909.—(*By Telegraph.*)

The market for steel products shows no relaxation in strength, although there has been a smaller volume of business the past week. The mills in practically all lines are so heavily covered with specifications that a disposition on the part of buyers to moderate their pressure is welcomed. Now that the policy of the leading mills is better understood in the trade, the feverish anxiety regarding deliveries on specifications shows a tendency to relax a little as consumers who make a practice of estimating their requirements a reasonable time in advance find they are having little difficulty in getting satisfactory deliveries and they have less fear of the future. The large agricultural implement makers, for example, have been very keen this fall in their pressure for shipments of bars, yet they have had no lack of steel for their consumptive needs, and it is understood that their anxiety was based upon fears of the future rather than present needs. The new 14 and 18 in. merchant bar mills at Gary will be ready for operation within a few weeks and will have considerable effect in satisfying the needs of Western consumers. The Inland Steel Company will also be able to turn out more bars and other mill products when the two additional open hearth furnaces recently decided upon are completed in April, as it has not had enough steel heretofore to operate all mill departments at full capacity. In wire products, pipe and other jobbing branches of the trade October was a very satisfactory month. New buyers of steel bars, structural shapes, plates and sheets still have the greatest difficulty in finding mills that will make prompt delivery, and it is necessary to pay the premiums that have prevailed for some time for prompt shipment. Sheets are particularly scarce, and large Western buyers have had difficulty in placing second orders where they had exhausted contracts running through the first half.

Pig Iron.—There has been moderate activity in the pig iron market the past week. The only transaction running into a large tonnage was the purchase by a local foundry interest of 8500 tons of No. 2 Southern and brakeshoe iron for delivery through the first half. This business was closed on an inquiry that has been pending for some time and is in addition to a round tonnage of high silicon iron which was taken by the same buyer two weeks ago. There are new inquiries pending this week for some 8000 tons of malleable Bessemer. A number of melters have made persistent efforts to get prices running through the year 1910, but it is understood that they have accomplished very little in this direction as the furnace interests, both Northern and Southern, are apparently firm in their refusal to make any commitments beyond the first half. The Southern furnaces are holding firm at $15, Birmingham, for No. 2 foundry for prompt and first half, but the market is not so strong for spot Southern iron as for the first quarter or first half, as a little resale iron comes out from time to time on which prices can be shaded. In Northern foundry grades there are no concessions on spot iron. One local producing interest asks $19.50 at furnace for any delivery up to and including the first half, while another continues to do $18.50 at furnace on November and December deliveries. One of the local producers ran short 3000 tons of completing shipments ordered for October on account of difficulty in getting cars. The car shortage is having more effect each week in all the iron producing districts in restricting the movement of coke and materials as well as shipments of iron from the furnace, and this is one of the important elements of strength in the price situation. The following quotations are for November and December delivery, f.o.b. Chicago:

Lake Superior charcoal	$19.50 to $20.00
Northern coke foundry, No. 1	19.50 to 20.00
Northern coke foundry, No. 2	19.00 to 19.50
Northern coke foundry, No. 3	18.50 to 19.00
Northern Scotch, No. 1	19.00 to 19.50
Southern coke, No. 1	19.85 to 20.35
Southern coke, No. 2	19.35 to 19.85
Southern coke, No. 3	18.85 to 19.35
Southern coke, No. 4	18.35 to 18.85
Southern coke, No. 1 soft	19.85 to 20.35
Southern coke, No. 2 soft	19.35 to 19.85
Southern gray forge	17.85 to 18.35
Southern mottled	17.60 to 18.10
Malleable Bessemer	19.00 to 19.50
Standard Bessemer	21.40 to 21.90
Jackson Co. and Kentucky silvery, 6%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 8%	21.40 to 21.90
Jackson Co. and Kentucky silvery, 10%	22.40 to 22.90

(*By Mail.*)

Billets.—Owing to the heavy demands of their own finishing departments, local mills are still unable to offer any material in the open market. Consumers of forging billets whose requirements are not covered by contracts find it extremely difficult to secure prompt shipment from any source. While the general level of current prices holds around $32 to $33, base, Chicago, for forging billets, no definite price is quotable, for the reason that each transaction is negotiated upon its merits and is governed by circumstances and conditions surrounding it.

Rails and Track Supplies.—The accumulation of rail orders for next year's rolling is being increased each week by new purchases of greater or less extent. Those of last week, aggregating 25,000 tons, represented additional contracts placed by three Western roads, all of which went to the Illinois Steel Company. The Harriman lines were included among the purchasers, the identity of the other two roads not being disclosed. That the orders thus far placed are short of next year's ultimate requirements is evident from the fact that other inquiries are under consideration. Among these are a lot of 3000 tons and another from a prominent Western system for an indefinite amount, the maximum of which is said to be about 40,000 tons. The demand for rail fastenings continues very heavy, the mills being unable to supply material of this character as fast as it is wanted. Business in light rails has improved considerably within the past few weeks, and orders for fair sized lots from industrial lines in mines and lumber plants are more numerous. We quote standard railroad spikes at 1.80c., base; track bolts and square nuts, 2.25c. to 2.50c., base, all in car lots, Chicago. Light rails, 40 to 45 lb., $26; 30 to 35 lb., $26.75; 16, 20 and 25 lb., $27; 12 lb., $28, Chicago, less 50c. a ton on lots of 500 tons and $1 a ton on lots over 500 tons.

Structural Material.—Very few contracts for fabricated material were closed last week and none of important size is reported. The Central Iron Works, San Francisco, was awarded a contract for 100 tons to be used in the construction of the Bohemian Club. In spite of the apparent dullness reflected in recent transactions there is a large amount of business under consideration and many new projects are coming up. Orders are, on the whole, piling up a good deal faster than shipments are going out. It should be noted in this connection, however, that delay in the receipt of material from the mills is retarding shop operations so that few, if any, are able to work to the best advantage. It was reported a few weeks ago that the general contract for the Boston Store, Chicago, a new structure calling for 3000 tons, had been let to John A. Griffith & Son, but it now appears that some hitch in the formal closure of this contract has occurred and the buyers are asking for new bids.

Very little tonnage contracted for at the extreme low prices ruling earlier in the year remains unspecified, practically all such business having been cleaned up in this district. It is the consensus of opinion among those interested in the market that the higher prices now prevailing are not likely to retard the development of new improvements nearly so much as long deferred deliveries of material. The extent of prompt requirements is seen in the extraordinary demand for shipment from warehouse stocks. Store prices were advanced again last week $2 a ton. We quote plain material from mill, 1.68c. to 1.78c., Chicago; from store, 2c., Chicago.

Plates.—The unsatisfactory condition as to deliveries existing in other lines of finished material is strongly marked in universal plates. On such specifications the local mill is unable to promise shipments of new orders prior to January 1. The sheared plate mills, however, are less congested and on orders involving desirable tonnage and specifications shipments can be made in eight or nine weeks. Consumers whose requirements will not permit of such delay are compelled to rely upon jobbers' stocks, and the aggregate of such orders is large enough to create a heavy demand. Under the stimulating effects of this movement prices have been steadily advancing, another rise of $2 a ton being announced last week. There is a small amount of mill business going at the minimum prices, but the majority of orders either for prompt or future shipment are being placed at $1 or $2 a ton above this figure. We quote mill prices at 1.68c. to 1.78c., Chicago; store prices, 2c., Chicago.

Sheets.—The sharp advance in the market value of spelter has created considerable difficulty for the sheet mills in this market in handling inquiries for galvanized sheets and has resulted in the practical withdrawal from the market of the leading local mill until the situation clears up. The advance in spelter since last June has made a difference of about $4 per ton in the spread that should prevail between No. 28 black and galvanized sheets, but the advance in the finished product since that time has been the same on both lines, without any increase in the spread. It is understood that no sales have been made in this market for delivery into next year except by Eastern mills, which have taken second orders from large consumers who had already covered with specifications their contracts to the end of their year next June. Nominal prices remain unchanged. We quote store prices on a basis of 2.85c. to 2.95c. for No. 28 black and 3.90c. to 4c. for No. 28 galvanized.

Bars.—Specifications for steel bars keep accumulating in undiminished volume, but there is good reason to believe that in many cases the urgency of consumers for prompt shipments is not dictated by actual needs. A feeling prevails in many quarters that it will be some time before the mills will be able to catch up on their rolling schedules to such an extent that prompt execution of orders will be possible. The implement makers especially are looking ahead with this idea in mind and are endeavoring to build up their stock piles to forestall a future shortage. Considerable business has been placed for first quarter of next year with some contracts running into the first half. Producers, however, are not nearly so anxious to make future commitments as buyers are to secure them. Practically all of the bar iron mills in this district are well supplied with orders and are able to run full on single turn at least. Prices have firmed up and concessions are as rare as they were frequent some time ago. Scarcity of steel bars has created a heavy demand from store, the effect of which has been to put prices up another $2 a ton. Jobbers find no difficulty in securing 1.90c., base, which is now the ruling price from store. We quote steel bars at 1.58c. to 1.68c.; bar iron, 1.55c. to 1.60c.; hard steel bars, rolled from old rails, 1.50c. to 1.55c., all Chicago.

Merchant Pipe.—The mills have had heavy specifications the past fall from implement manufacturers, who have all made large estimates for their prospective business for next year. The general jobbing trade has contributed a good volume of business and altogether October was a very satisfactory month. Prices remain unchanged.

Boiler Tubes.—There has been considerable improvement recently in the inquiry for locomotive tubes growing out of the great improvement in railroad traffic and financial conditions. The merchant boiler shops are also doing more business each month with a corresponding increase in their specifications for boiler tubes. Prices show very little change in either direction.

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Company has closed recently contracts for gas pipe amounting to about 20,000 tons for the People's Gas Light & Coke Company, Chicago, and other gas companies in this territory. Municipal lettings of water pipe have been light the past week, as the buying season in this line has about closed in Northern territory for this year's delivery. Routine inquiries keep up fairly well on small lots for quick delivery, and a number of municipalities are talking about getting in early for next year's requirements. Prices remain practically unchanged but firm. We quote per net ton, Chicago, as follows: Water pipe, 4-in., $28.50; 6 to 12 in., $27.50; 16-in. and up, $26.50, with $1 extra far gas pipe.

Metals.—The remarkable strength in spelter continues to be the feature of the market. The demand does not seem to be commensurate with the rise in value, but prices are nevertheless firmly held. Although no actual advance has taken place in copper, the general tone of the market is considerably firmer. The opinion prevails among dealers that some of the weaker holders of this material have unloaded, and the situation is improved by reason of the fact that the surplus stocks in the country are now in stronger hands. There has been a fair demand during the past week, including some good sized lots for shipment through November and December. Some heavy purchases have also been made by manufacturers of car brasses. We quote as follows: Casting copper, 13c.; lake, 13⅜c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, car lots, 31½c.; small lots, 33c.; lead, desilverized, 4.45c. to 4.55c., for 50-ton lots; corroding, 4.70c. to 4.80c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 6.30c. to 6.40c.; Cookson's antimony, 10⅜c., and other grades, 9¾c. to 10¼c.; sheet zinc is $8, f.o.b. La Salle, in car lots of 600-lb. casks. On old metals we quote: Copper wire, crucible shapes, 13¼c.; copper bottoms, 11½c.; copper clips, 12¼c.; red brass, 12c.; yellow brass, 9¼c.; light brass, 6¾c.; lead pipe, 4½c.; zinc, 5c.; pewter, No. 1, 23c.; tin foil, 25c.; block tin pipe, 27c.

Old Material.—The market for iron and steel scrap is easier in tone and prices are fractionally weaker, not through any lack of consumptive demand, but because the offerings through dealers have been growing heavier. The marked advance in prices last fall set in motion a large volume of the scrap that has accumulated around the country the past two years and in some cases mills that are steady buyers have not been able to take in material as fast as it has been offered them. Spot melting steel sells around $16, but the Burlington received $16.50 last week for the frogs, switches and guards on its list. Car wheels have been sold at $18.50 this week, and further buying by foundries is under consideration. Railroad wrought scrap is a shade weaker, but active buying of busheling scrap continues, making a good demand for pipe and other busheling material. Cast scrap is weaker. Car axles are scarce and actively sought. The following prices are per gross ton, f.o.b. Chicago:

Old iron rails	$21.00 to $21.50
Old steel rails, rerolling	18.00 to 18.50
Old steel rails, less than 3 ft	17.25 to 17.75
Relaying rails, standard sections, subject to inspection	23.50 to 24.50
Old car wheels	18.50 to 19.00
Heavy melting steel scrap	16.00 to 16.50
Frogs, switches and guards, cut apart	16.25 to 16.75
Shoveling steel	15.50 to 16.00

The following quotations are per net ton:

Iron angles and splice bars	$18.00 to $18.50
Iron car axles	21.50 to 22.00
Steel car axles	20.50 to 21.00
No. 1 railroad wrought	15.75 to 16.25
No. 2 railroad wrought	14.75 to 15.25
Springs, knuckles and couplers	15.25 to 15.75
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	13.50 to 14.00
Steel axle turnings	11.75 to 12.25
Machine shop turnings	11.00 to 11.50
Cast and mixed borings	7.50 to 8.00
No. 1 busheling	13.75 to 14.25
No. 2 busheling	10.25 to 10.75
No. 1 boilers, cut to sheets and rings	11.50 to 12.00
No. 1 cast scrap	15.25 to 15.75
Stove plate and light cast scrap	13.75 to 14.25
Railroad malleable	15.25 to 15.75
Agricultural malleable	13.50 to 14.00
Pipes and flues	12.25 to 12.75

St. Louis.

ST. LOUIS, MO., November 1, 1909.

Inasmuch as bank clearings have always been regarded as a good business barometer, the fact that the business at St. Louis banks for the past month breaks the record is substantial evidence of prosperous conditions. The demand for money is large and rates are firm at 5 to 6 per cent. on call and time loans.

Coke.—A good demand is reported for foundry coke, coming from all parts of St. Louis territory, mostly, however, from the class of trade that buy little and buy often, there being an absence of large inquiries. The leading brokers state that the market is strong and tending upward. Producers are not shipping freely on account of car shortage and short supplies. Specifications on contract are in satisfactory receipt. Connellsville 72-hour standard foundry is held at $3.25 to $3.50 per net ton, f.o.b. oven, for shipment over the balance of the year, and $3.25 to $3.50 for delivery over the first half of 1910.

Pig Iron.—None of the leading sales agencies reports having inquiry for round lots for any class of iron, though there is a fair demand from medium to large buyers in St. Louis territory. A member of a prominent house who has just returned from a visit to Birmingham states that he found all the furnaces holding iron firm at $15 for this year and first quarter of 1910 and that some of the furnaces declined to quote for the second quarter. In talking with the local traffic officials he learned that while they anticipate a shortage of cars during the coming winter, they do not look for serious trouble. Shipments are moving freely at present.

Stocks at the furnaces are low, after allowing for what is being held for account of owners. In the opinion of this party St. Louis is the best market for the moment for Southern iron, since after looking into the cost of delivery, it is seen that Middlesbrough (England) No. 2 foundry costs about $17.25, delivered on the wharf at New York and Philadelphia, as against $19.25 for Birmingham No. 2, based on $15 at the furnace and $4.25 freight (rail and water rate). In case of Cincinnati, southern Ohio strong No. 2 foundry iron costs $18.20, made up of $17 and $1.20 freight, as against Southern iron at $15, plus $3.25 freight, without taking into consideration the premium usually commanded by the former. About the same conditions prevail in Chicago territory, Ohio iron being now $19.40, as against $19.35 for Southern. At St. Louis Ohio iron costs laid down $19.50, as against Southern at $18.25. A leading house bought 500 tons of warrant iron at a little less than $15, Birmingham, and more is offered. Speculative holdings and foreign iron are tending to check any further advance in the market at present, and large buyers have bought for forward delivery. The market is in a waiting mood, with prices unchanged, but firm. Virginia iron has been advanced 50c. per ton. For Southern No. 2 foundry we quote $15, for shipment this year and first half of 1910, f.o.b. Birmingham.

Lead, Spelter, Etc.—Lead is steady, at 4.25c. Spelter is active, at 6.27½c. to 6.30c., East St. Louis. Zinc ore is selling at $50 to $51 per ton, 60 per cent., Joplin, base, with a good demand and strong market. Tin is 5c. per 100 lb. higher; antimony unchanged; copper unchanged. The demand for finished metals for the past week was fairly good.

Old Materials.—The leading dealers report a quiet demand and fairly steady market. The slack inquiry is in part due to congestion of freight in the yards of foundries and mills, and further arrivals of cars would subject them to expense for demurrage. There are no railroad lists out. There is very little change in prices for the week. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails	$18.00 to $18.50
Old steel rails, rerolling	16.50 to 17.00
Old steel rails, less than 3 ft	16.00 to 16.50
Relaying rails, standard sections, subject to inspection	25.00 to 25.50
Old car wheels	17.50 to 18.00
Heavy melting steel scrap	16.00 to 16.50
Frogs, switches and guards, cut apart	16.00 to 16.50

The following quotations are per net ton:

Iron fish plates	$15.00 to $15.50
Iron car axles	21.00 to 21.50
No. 1 railroad wrought	16.00 to 16.50
No. 2 railroad wrought	15.00 to 15.50
Railway springs	14.00 to 14.50
Locomotive tires, smooth	16.00 to 17.00
No. 1 dealers' forge	11.50 to 12.00
Mixed borings	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	11.50 to 12.00
No. 1 cast scrap	14.50 to 15.00
Stove plate and light cast scrap	10.75 to 11.25
Railroad malleable	14.00 to 14.50
Agricultural malleable	12.00 to 12.50
Pipes and flues	11.75 to 12.25
Railroad sheet scrap	10.50 to 11.00
Railroad grate bars	12.00 to 12.50
Machine shop turnings	10.50 to 11.00

A bill is about to be passed providing for the construction of a 60-ft. viaduct over Compton avenue. A plan is also under consideration for the treatment of the Ewing avenue crossing, which will require a viaduct 60 ft. wide and 1308 ft. long, the estimated cost being $240,000.

Lead leads all other minerals in the State of Missouri. The output for 1908 is reported at $8,665,913. The output of zinc was $6,374,719.

The city of St. Louis contemplates reducing the water rates for manufacturing establishments from 8c. per 1000 gal. to 5c.

Among recent incorporations is that of the Missouri Zinc & Lead Mills Company, St. Louis; capital stock, $50,000.

The St. Louis & San Francisco Railroad reports that during the year ending June 30 there were located on the line of the road 327 industries employing 8710 men and costing $7,330,500. It is estimated that these new industries will load, in and out, 80,000 carloads per annum.

The sale is announced of 23,000 acres of mineral land in Washington County, Mo., near Potosi. This tract contains what is claimed to be the most valuable deposit of barytes in the world. The purchaser is Edwin M. White of Yarmouth, Mass. It is reported that St. Louis will be made the headquarters of the corporation which will control the property. C. G. Norris of Boston is also interested in the purchase.

The eighth annual banquet of the Westinghouse Veteran Employees' Association was held last week at Wilmerding, Pa., about 170 members being present. This organization is made up of employees who have been in the service of the Westinghouse Air Brake Company for more than 21 years.

Pittsburgh.

PARK BUILDING, November 3, 1909.—(*By Telegraph.*)

Pig Iron.—The past week has been the most active in the local pig iron market for some time. Following the heavy purchases of Bessemer iron enumerated in our report by mail, other smaller lots have been sold—one of 3000 tons, another of 1500 tons and one of 1000 tons, all at $19, Valley furnace. We also note a sale of 5000 tons of basic iron made by a Valley furnace interest to a local consumer for delivery in first quarter of next year at $17.50, at furnace. The American Steel Foundries and the Scullin-Gallagher Iron & Steel Company, St. Louis, are reported to have bought in all upward of 50,000 tons of basic iron in the past week or two, the business going to outside furnaces. The market on foundry, forge and malleable Bessemer iron is quiet, and there is not much new inquiry for basic. Prices are firm. We quote Bessemer iron at $19 for November and December and first quarter of next year; basic, $17.25 for prompt shipment and $17.50 for first quarter; No. 2 foundry, $17.25 to $17.50; malleable Bessemer, $17.50 to $17.75, and gray forge, $16.25 to $16.50, all at Valley furnace, with a freight rate of 90c. a ton for delivery in the Pittsburgh District.

Steel.—There is not much new inquiry for billets and sheet and tin bars, consumers being covered by contracts. Only occasional small lots are wanted. These bring premiums in prices and range from $27 for 4 x 4 in. Bessemer to $27.50 to $28 for open hearth billets, maker's mill, with full freight to destination added. The Republic Iron & Steel Company and the Youngstown Sheet & Tube Company will have less steel to sell in the open market beginning with next year than formerly. The Republic Company is building large tube mills at Hazelton, Ohio, which when completed will take a good part of its steel output, and the Youngstown Company is adding eight more sheet mills, which will take still more of its output of sheet bars. No price has yet been fixed by the Carnegie Steel Company or other sellers on sheet and tin bars for first quarter delivery. Forging billets continue scarce and for prompt shipment are quoted at about $30, at maker's mill.

(*By Mail.*)

The principal activity in the past week has been in Bessemer pig iron. On Thursday, October 28, the Bessemer Pig Iron Association, through J. G. Butler, Jr., chairman, sold 30,000 tons of standard Bessemer iron, for delivery at the rate of 5000 tons a month, November to April, to the Youngstown Sheet & Tube Company at $19, Valley furnace. Later W. P. Snyder & Co. sold the same interest 10,000 tons of Bessemer iron for November and December delivery at the same price, and also sold another consumer 3000 tons of Bessemer, also $19, at furnace. Reports are that some very small lots of Bessemer for spot shipment have been sold at slightly above $19, but these are not verified. The Jones & Laughlin Steel Company is also figuring on the purchase of some additional Bessemer iron for this year, the company running short of pig iron, in spite of the fact that its five Eliza and one Soho furnaces are making about 70,000 tons of pig iron per month. This company is operating its works to absolutely full capacity, making more steel than ever before in its history. The company expected to get one of its new Aliquippa furnaces in blast before this, but the work has been delayed, and it is hardly likely that the first of these three furnaces will be ready for blast before December 1. It is planned to start one furnace in about 30 days, another about January 1, and a third stack in February. The market on basic iron is quiet, but it is firm in price and held at $17.50, Valley furnace, for delivery in first quarter of next year. There is not much doing in foundry or forge iron, but the market is strong. The ferromanganese market has also been active. The mills are not catching up to any extent on back deliveries of billets and sheet and tin bars. Available steel for prompt shipment continues scarce, Bessemer billets ruling about $27, and open hearth at $27.50 to $28, at maker's mill. Reports were current late last week of an advance in prices of sheets, but, while this is expected by the trade, it has not yet taken place. The scrap trade has quieted down somewhat, and prices are easier, especially on borings and turnings. Standard makes of blast furnace coke for first half delivery continue firm at $2.85 to $2.90 per net ton at oven. While the market is not displaying the snap and energy that it did two or three weeks ago in new orders, this is rather pleasing to the mills, as it will give them a chance to catch up to some extent on deliveries.

Ferromanganese.—The leading local consumer is credited with having bought 8000 to 10,000 tons of foreign 80 per cent. ferromanganese for delivery in November and December and the first two months of next year at $44.50 to $45, f.o.b. cars, Pittsburgh. A local dealer is credited with having bought 9000 to 10,000 tons for delivery over all of next year at a somewhat higher price, and predictions are

made that prices will rule higher in the near future. We quote 80 per cent. foreign for this year and into the first three months of next year at $44.50 to $45, seaboard. Some sellers are asking as high as $46 for first quarter delivery.

Ferrosilicon.—The market is quiet, no inquiries having come out in the past week. We quote 10 per cent. at $23.90; 11 per cent., $24.90; 12 per cent., $25.90, and 50 per cent., $63.50 to $64, seaboard.

Muck Bar.—The market is quiet but prices are firm. We quote best grades made from all pig iron at $29.50 to $30, Pittsburgh. The Wilkes Rolling Mill Company has started up its puddling mill at Sharon, Pa., and is now a producer of muck bar for the first time in some months.

Wire Rods.—A good many new inquiries are in the market from chain manufacturers and other consumers for delivery into next year, but so far the manufacturers are refusing to take such business at present prices. The market is very strong, and we quote Bessemer open hearth and chain rods at $32, Pittsburgh, for delivery this year.

Skelp.—The market has quieted down as regards new inquiries, but the mills are filled up with orders for some time ahead. Prices are firm and we quote: Grooved steel skelp, 1.45c. to 1.50c.; sheared, 1.55c. to 1.60c.; grooved iron plates, 1.75c. to 1.85c., and sheared iron plates at 1.90c. to 1.95c., all for ordinary widths and gauges, f.o.b. Pittsburgh.

Steel Rails.—Active inquiries are in the market from the New York Central, the Erie and other leading railroads for their rails for next year, but up to this time the contracts have not actually been placed. The Carnegie Steel Company took new orders in the past week or so for 9000 to 10,000 tons of standard sections, and also received new orders and specifications for about 2200 tons of light rails. Prices on light rails are very strong and an advance is predicted in the near future. We quote steel axles at 1.75c. to 1.80c., and splice bars, 1.50c., at mill, Pittsburgh. Light rail prices are as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 and 45 lb., $27, Pittsburgh. These prices are for 250-ton lots and over, and for small lots premiums of 50c. per ton and more are being paid. We quote standard sections at $28, at mill.

Plates.—Buying of steel cars and locomotives has been very active, and the leading steel car companies now have more orders on their books for steel cars than at any time in the past two years. Last week the Baltimore & Ohio placed orders for 4400 steel cars, in addition to about 5600 placed by this road some months ago, making 10,000 cars in all. The Standard Steel Car Company got 2400 steel hopper cars, the Cambria Steel Company 1000 steel hopper cars and the American Car & Foundry Company 1000 steel underframe box cars. Other roads have bought heavily of steel cars, engines and other equipment and these orders will result in an enormous tonnage of plates, shapes and bars being placed with local mills. The engagements of the Carnegie Steel Company on plates are such that its entire output is practically under contract to April 1, 1910. The Jones & Laughlin Steel Company is also sold up on plates for several months, and there seems to be no doubt that the plate mills will have steady work through the winter months. We quote ¼-in. and heavier plates at 1.50c. for forward delivery, while on prompt shipments 1.55c. to 1.60c. is asked.

Structural Material.—Deliveries from the mills on structural shapes are better than for some time, and the American Bridge Company has been able to put its Ambridge plant on double turn, this being the first time it has run double turn in nearly two years. The McClintic-Marshall Construction Company has taken a large power plant for Osgood, Bradley & Sons at Worcester, Mass., embracing power house, construction shop and other smaller buildings, calling for about 1500 tons of steel. The Pennsylvania Steel Company was the lowest bidder on the projected steel bridge across the Ohio River at Wheeling, taking about 3000 tons, but the contract has not yet been placed. The American Bridge Company has taken a large warehouse in Boston, 1200 to 1500 tons, and some more dock work for a Western railroad, about 2000 tons. We quote beams and channels up to 15-in. at 1.50c., while small lots for prompt shipment command 1.60c. and higher in some cases.

Sheets.—Persistent reports that the American Sheet & Tin Plate Company had made an advance last week in prices of sheets are untrue, but probably arose from the fact that a number of the independent sheet mills are asking advances of $2 to $3 a ton on contracts for sheets for delivery through the first quarter of next year. This is being done by these mills to protect them against higher prices of sheet bars, which will probably rule for the quarter beginning January 1. Consumers are specifying freely on contracts for sheets, and all the mills are filled up with orders for the next several months and are somewhat behind in shipments. It is the general belief that an advance of at least $2 a ton will be made on sheets before the first of the year. Reports that the American Sheet & Tin Plate Company would abandon its Aetna-Standard Works at Bridgeport, which contains 23 hot sheet mills, are premature. This plant has been idle since July 1, and no attempt has been made by the company to operate it. Prices on sheets are very firm, some mills refusing to enter orders for first quarter except at an advance in prices. Blue annealed sheets are quoted as follows: Nos. 3 to 9, 1.65c.; Nos. 9 and 10, 1.70c.; Nos. 11 and 12, 1.75c.; Nos. 13 and 14, 1.80c., and Nos. 14 and 15, 1.90c. One-pass box annealed No. 28 black sheets are now 2.30c. and No. 28 galvanized 3.35c., at mill. We quote corrugated roofing sheets at $1.60 per square for painted and $2.85 for galvanized, 2½-in. corrugations. Jobbers charge the usual advances over these prices for small lots from store.

Tin Plate.—The American Sheet & Tin Plate Company is getting its Humbert Works at South Connellsville, Pa., containing six hot mills, ready for operation and expects to start it early in December. The La Belle and Laughlin works of the company at Wheeling are still closed down tight, and no attempt has been made by the company to operate either of these works since the strike started on July 1 last. Reports that the equipment of these two plants would be moved to other mills have not been verified, and are probably incorrect. Consumers are specifying freely against contracts for tin plate, and shipments by the mills are heavy. We quote 100-lb. cokes at $3.50 per base box, f.o.b. Pittsburgh, for the remainder of this year and first quarter of next.

Bars.—Several of the leading steel bar mills have booked a very heavy tonnage for delivery in the first quarter of next year, and contracts for this delivery are still being placed. In fact, the leading steel bar mills are pretty well filled up to April 1 of next year, and in some cases are refusing to book contracts offered, or else are scaling down very considerably the tonnage called for in these contracts. We quote steel bars at 1.50c. to 1.55c. at mill for reasonably prompt shipment, but on contracts for first quarter delivery two leading mills are quoting about 1.45c. at mill. The mills making iron bars are almost as badly congested with work as the steel bar mills, and prices are very strong. We quote iron bars at 1.60c. to 1.65c., at mill, Pittsburgh.

Hoops and Bands.—New demand continues active, specifications against contracts are coming in freely, and the mills are filled up with orders for the next several months or longer, and are somewhat behind in shipments. We quote hoops for forward delivery at 1.50c., and for prompt delivery at 1.60c. to 1.65c., at mill. Steel bands are very firm at 1.40c. to 1.45c. on contracts and 1.50c. to 1.55c. for prompt shipment.

Spelter.—Prices on this material continue to soar, and this week prime grades of Western spelter are selling at very close to 6.25c., East St. Louis, the freight to Pittsburgh being 12½c.

Spikes.—Some large inquiries from leading railroads are in the market, and it is probable that heavy contracts will be placed in the near future. Several of the spike makers continue to refuse to sell for delivery into next year, except at an advance. Prices are firm, and for local trade standard sizes of railroad spikes are now held at $1.75 to $1.80, while for delivery in Eastern and Western territory $1.70 to $1.75 is quoted in carload and larger lots, with 5c. per keg advance for small lots.

Shafting.—New buying continues active, and specifications are coming in freely. Makers of shafting have more orders on their books at present than at any time in the past year or more and shipments are heavy. The market is firm, on the basis of 57 off in carload lots and 52 in less than carload lots, delivered in base territory and for delivery this year, while for delivery next year quotations are 55 in carload and larger lots and 50 off in less than carload lots, delivered in base territory.

Rivets.—The demand for rivets has quieted down somewhat since the last advance in prices was made, but consumers are taking out material freely on orders placed prior to the recent advance. Prices are as follows: Structural rivets, ¾ in. and larger, 2.05c., base; cone head boiler rivets, ¾ in. and larger, 2.15c., base; ⅝ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Merchant Pipe.—As yet the inquiry of the Manufacturers' Light & Heat Company for six miles of 12-in. pipe has not been placed. Orders for pipe entered by the mills in October were about as heavy as in September, but the situation will likely quiet down a little now, on account of the lateness of the season. As yet no advance has been made in the prices of steel pipe, but it is not unlikely that an advance in prices of iron pipe may be made in the near future, one local mill having been quoting for some time on the basis of 74 and 5 off for ¾ to 6-in. pipe. The official discount on black steel pipe, ¾ to 6 in., is now 80 and 5, and on iron pipe, ¾ to 6 in., 75 and 5, in carload and larger lots to the largest trade. It should be noted that these prices are absolutely minimum, and are only made to the large trade in carload and larger lots, jobbers charging the usual advances to the smaller trade for shipments from store.

Boiler Tubes.—The demand for locomotive tubes is showing a steady increase and some large inquiries are in

the market. The large contracts for locomotives recently placed by the New York Central, the Erie and other leading railroads should soon bring about some heavy orders for boiler tubes to equip these locomotives. The demand for merchant tubes is also showing some improvement, but the mills could take care of more business if they had it. Official discounts printed elsewhere are still being slightly shaded.

Iron and Steel Scrap.—Leading consumers of scrap are either filled up for some time ahead or else have made an agreement not to place contracts for scrap at ruling prices, as the market has quieted down very considerably, dealers finding it difficult to make sales except by offering concessions in prices. The pressure of a good deal of scrap that is loaded on cars and must find destination has resulted in several small sales of heavy steel scrap having been made at $17.50, although dealers still regard the reguar market as $18. We continue to quote heavy steel scrap at $18, but on a firm offer it is probable that some could be picked up without much trouble at $17.50 or perhaps less. Dealers quote No. 1 cast at $17.25 to $17.50; No. 2, $16.25 to $16.50; bundled sheet scrap, $16.25 to $16.50; No. 1 railroad malleable, $16 to $16.25; rerolling rails, $18.25 to $18.50, for delivery at Newark, Cambridge or Cumberland, Md.; grate bars, $14 to $14.25; No. 1 busheling scrap, $16.25 to $16.50; No. 2, $13.25 to $13.50; low phosphorus melting stock, 0.04 and under, $21 to $21.25; steel axles, $21.50 to $21.75; iron axles, $27.50 to $28; locomotive axles, $28 to $28.25; old car wheels, $18.50 to $18.75, and No. 1 railroad wrought scrap, $18.50 to $18.75. Borings and turnings have gone off in price, and we quote cast iron borings at $11 to $11.25 and machine shop turnings, $13.25 to $13.50. There is a good demand for sheet bar crop ends and also for No. 1 cast scrap. Sheet bar crop ends are firm at $19.50, at shipping point. All above prices are per gross ton, f.o.b. cars, Pittsburgh, unless otherwise stated. We note sales of about 300 tons of heavy steel scrap at $17.50; 800 tons of No. 1 cast scrap at $17.50, and 300 tons of sheet bar crop ends at $19.55 per gross ton at shipping point. Several important scrap lists closed this week, the Pennsylvania Railroad Lines west, November 3, and the New York Central, November 4. The scrap list of the Pennsylvania Railroad East closes November 9.

Coke.—The output of coke in the Klondike and Connellsville regions is heavier now than at any time in the past two years, amounting last week to 441,789 tons. The demand for furnace and foundry coke is active, and standard makes of furnace coke for delivery in the first half of next year are firm at $2.85 to $2.90 per net ton at oven. For prompt shipment, best makes of furnace coke are quoted at about $2.75 per net ton at oven. Standard makes of 72-hour foundry coke for delivery in the first half of next year are quoted at $3 and up to $3.50 per net ton at oven.

Walter-Wallingford & Co., People's Bank Building, Pittsburgh, have been appointed selling agents for the pig iron of the Southern Iron & Steel Company, in Chicago, Detroit, Cleveland, Pittsburgh, Cincinnati, Louisville and all intermediate territory. Arrangements are under way for the opening of a Chicago office of this firm.

San Francisco.

SAN FRANCISCO, October 27, 1909.

The situation in most lines of finished materials on the Pacific Coast has taken a decided turn for the better. The gradual increase of business has brought about a stronger market, and the price cutting which has made business unprofitable for local merchants during the last year has been stopped, bringing prices in San Francisco about to a parity with those in the East. While the increasing firmness is apparent in all departments, bars and merchant pipe are the lines principally affected. The present advance, with a prevailing expectation of a continued upward movement, has induced a more pressing demand on the part of consumers, who show great anxiety to cover their requirements of the near future. The jobbers are also coming into the market more actively. They regard conditions as favorable for a profitable business during the coming year, and find more inducement to carry large supplies than in the past. Orders for structural fabrication are slow in coming out, and few large projects are in prospect locally, though there is still a good movement of the raw material. Hoops are scarce, with larger requirements on the Coast than for several years past. The advancing prices of cast iron pipe have brought out a larger inquiry, the numerous small orders which are now being booked amounting to a considerable tonnage. Pig iron and old material are less active, but both are firmly held.

Structural Material.—According to figures prepared by the San Francisco Architectural Club the value of building operations in this city from May, 1906, to July 31, 1909, is $139,584,538, including 86 class A buildings, valued at $20,063,260; 113 class B, $8,435,871, and 1477 class C, $45,510,644. The amount of steel used between the dates mentioned is estimated at 284,715 tons. The local situation has been comparatively quiet for several weeks, and there is little work of importance in immediate prospect. The tonnage, however, has so far been well maintained, fabricating orders being already booked for several months in advance, and there has been no decrease in the inquiry for the raw shapes on the part of local fabricators. While the office building requirements of the city are satisfied for the present, plans are being made for several large buildings for the city and for local clubs. The amount of small work in prospect is increasing, and is taken almost entirely by local shops, who are taking such jobs at prices too low to attract Eastern interests. The latter are still holding aloof from this market, taking only occasional jobs of comparatively small proportions. A fabricating contract is to be let shortly for the new Olympic Club Building. Plans have been accepted for the new Masonic Temple, for which contracts amounting to about $800,000 will be let. The Supervisors have authorized the erection of a new county jail, appropriating $150,000 for preliminary work. The Bohemian Club contract has been let. A six-story addition is to be built for the Golden West Hotel, and a large steel frame apartment building is being figured. The tonnage required at other Pacific Coast points is rapidly increasing, buildings in prospect in the Northwest being a 14-story court house at Seattle, Wash., a seven-story hotel and a $500,000 building for the Union Savings & Trust Company at the same place, and a 10-story building for the Commercial Club at Tacoma. The Moran Company has the steel contract for the Northern Bank & Trust Company's building at Seattle. Bids will be opened November 1 for a jail at Elko, Nev. Plans are being made for a $350,000 steel frame court house at Bakersfield, Cal. Beams and channels, 3 to 15 in., are quoted at 2.65c. from store in San Francisco.

Bars.—Unusual firmness has developed in the local bar situation, owing to a continued large demand and the depletion of supplies in the hands of local merchants. Some sections have become very scarce, and great difficulty is experienced in filling sorting up orders. While a heavy tonnage of foreign bars has been ordered, arrivals will not increase sufficiently to relieve the situation for several months. Prices have been badly demoralized for some time, but a firm basis has now been established, as present conditions make price cutting practically impossible. Requirements continue to increase, buyers being especially active since the advance in prices. The output of local manufacturers is closely sold up for some time to come, and the outlook is for a profitable market throughout 1910. Merchants quote the following prices for bars, from store, San Francisco: Steel, 2.40c.; iron, 2.20c.

Pig Iron.—A considerable tonnage of pig iron has been moved during the last month, but the recent purchases appear to have filled the immediate requirements of the local foundries and the market is rather quiet at the moment. Foundry operations are also less active than a few weeks ago, but in view of the municipal work on hand and in prospect this condition is believed to be only temporary. This market shows little strength except in response to the increasing firmness in other quarters. While recent arrivals have been light, the spot supply is still large, and there is no disposition on the part of melters to buy for future arrival, though large purchases of Chinese iron by local importers are reported. Importers quote the following spot prices on foundry iron: Chinese, $25; English and Continental, $23 to $24.50. There is scarcely any movement of domestic iron in this market, but No. 2 Southern foundry iron is quoted at $25.

Cast Iron Pipe.—Large requirements on the Pacific Coast have been coming up very slowly, most of the contracts recently reported involving only a small tonnage, while very few new specifications of any importance are being figured. The movement is nevertheless slightly greater than for several weeks past, owing to the increasing number of small orders from both municipalities and corporations. Prices are extremely firm, with some advance over previous quotations, and buyers are accordingly coming into the market for their winter's requirements. Many inquiries have been received on which orders will probably be booked early next month, and all indications favor a satisfactory movement up to the close of the year. The only notable contract reported recently is about 900 tons for Colusa, Cal., awarded to the United States Cast Iron Pipe & Foundry Company. Redwood City, Cal., will receive bids Nov. 1 for 1400 ft. of 8-in., 4280 ft. of 10-in., and small lots of 12, 6 and 4 in. pipe. Prices are now quoted at $39 for 4-in., $38 for 6 to 12 in., and gas pipe $1 extra.

Merchant Pipe.—After a long period of irregularity in prices, definite values have been established for the jobbing business in merchant pipe in San Francisco, the present figures showing a material advance over those that have prevailed in the past. No large individual inquiries have come up for some time, but a steady movement has been in progress for the last month, and the total tonnage is slightly greater than for the month preceding. Following the stiffening of prices, heavy orders have been received by the local

merchants and the latter are buying more freely than before. The outlook for business in the oil fields is steadily improving, recent bookings showing some increase over those of the early fall. The values now being realized on the output of productive wells are drawing additional investment in that direction, and the supply interests anticipate a very active year. A contract is to be let Nov. 3 for a large lot of 4 and 5 in. galvanized pipe for the Hawaiian Islands.

Old Material.—The heavy purchases of the last two months have filled immediate requirements of buyers on the Pacific Coast, besides cleaning up the market of the heaviest offerings. Business is accordingly rather quiet at the moment, though the feeling on most descriptions is very firm. There is still some inquiry for cast scrap, and most of the available stock is held at the top quotation, while some dealers are asking an advance. Other descriptions are dull, with none of any consequence offered. Prices are quoted as follows: Cast scrap, heavy, $18, light, $17 per gross ton; steel scrap, $6 to $7 per gross ton; railroad wrought scrap, f.o.b. San Francisco, $10.50 to $11 per net ton; old steel rails, $9.50 per net ton.

The Pacific Hardware & Steel Company has taken a 20-year lease on a $100,000 building, to be erected immediately in Los Angeles. It will have four stories, covering an area 80 x 200 ft., besides a large one-story warehouse.

P. Noble of the Pacific Rolling Mill Company has just returned from a visit to the mills at Gary.

The Abner Doble Company has sold out its bar iron and steel business to the Judson Mfg. Company, and will hereafter devote its entire attention to the water wheel and machinery lines.

N. Samwell of Rangoon arrived here recently to purchase mining machinery. He expects to place orders amounting to nearly $1,000,000.

Chas. C. Moore & Co. have started work on their contract for 2400 tons of cast steel specials for the new water system. Chas. C. Moore returned last week, after spending some time in Europe and the East in the interest of the Portola festival.

Marine business is still increasing at this port. The Western Pacific Railway has called for bids on steel hulls for a number of large ferryboats. The Moore & Scott Iron Works is building a large barge for the Associated Oil Company and making repairs on several vessels. Eleven vessels are awaiting repairs at the Union Iron Works drydocks. The marine department, foundry and machine shops of the Union Iron Works are now in full operation.

Mr. Finnegan, purchasing agent for the United Railroads, has just returned from the East.

The Enterprise Foundry Company has taken a contract to supply 890 10-in. valves for the water supply system. The price for iron castings is 3¼c. per pound.

The Producers' Transportation Company has let contracts for power machinery in connection with its pipe line, the principal contracts going to the Machinery & Electrical Company of Los Angeles and Fairbanks, Morse & Co.

Philadelphia.

PHILADELPHIA, PA., November 2, 1909.

Fairly active buying in crude and nearly all classes of finished materials continues. In some grades purchases for early 1910 deliveries are more extensive, usually at higher prices than those ruling for reasonably prompt shipments. More inquiry for some classes of pig iron is noted, with prices exceedingly firm. Producers maintain a very strong position, and tonnage for early delivery, except in broken lots, is practically cleaned up. The continued activity of the railroads in placing orders for rolling stock and motive power is encouraging, practically assuring a further good demand for materials entering into their construction. Steel billets have been more active, some fair quantities being taken for early 1910 deliveries at $1 advance over recent prices. Sheets are very strong, prompt shipments commanding sharp premiums. Old material is less active and prices have receded slightly, but the decline is believed to be only temporary.

Pig Iron.—Considerable inquiry for foundry iron is noted, both for early and forward delivery. Sellers, however, have no large tonnage to offer for early shipment and still hesitate when it comes to taking any important contracts for extended shipment, as future costs are, to some extent, still uncertain. Stocks on furnace banks are low, but from the freedom with which deliveries are being taken by consumers it is believed that the latter may be accumulating some stock. Prices continue strong; off grades may be had a trifle under the market, but standard brands are firm. Sales, while mostly small individually, aggregate a fair tonnage. A few sizable orders are reported. One lot of 1000 tons of No. 2 X for November-December shipment, was done at $19.25, delivered. Moderate quantities, however, command from $19 to $19.50 for No. 2 X for deliveries extending over the balance of the year and first quarter of 1910. Several fair lots of low grade iron have been sold to cast iron pipe foundries, one seller reporting an aggregate of 3000 tons during the week, of which 1250 tons was forge, to a Delaware River foundry, at $17.80, delivered. Virginia foundry iron has not been active; sales, some of which run up to several hundred tons, for prompt and first quarter delivery, are reported. One lot of 700 tons of No. 2 plain, for December-February shipment, was sold at $19, delivered. The leading Virginia interest will, it is believed, mark up its price 50 cents a ton, making a $17, furnace, basis for No. 2 X foundry. Southern foundry irons still show no movement in this territory. The forge iron market is somewhat more active, more tonnage being under negotiation for shipment early next year. Several producers are now holding this grade at $17.25, furnace. Several lots aggregating about 5000 tons are being inquired for, and it is doubtful if any standard forge iron could be had under $17.75, delivered in this vicinity, at which figure several small lots, for reasonably early delivery, have been sold. Considerable interest is being taken in the basic iron situation. The unexpected blowing out of a large Schuylkill Valley furnace, reported last week, will hold up delivery on probably 25,000 tons of this grade before the furnace can be put in again. A fire a few days ago at one of the New Jersey furnaces will, however, result in but a temporary stoppage and should have no effect on the market. The shortage in basic for this year's delivery from the foregoing causes will not, it is believed, affect any of the steel mills, as they have in almost every instance either accumulated a little iron or have bought sufficient to take care of just such delays in deliveries. While the majority of mills are covered for this year and first quarter requirements, several sales for such shipment have been made. One lot of 3000 tons, for November-January, and another for 5000 tons, in shipments of 1000 tons per month, are reported at $19, delivered. The latter sale was Virginia basic, makers of which have now advanced their price to $17, at furnace. Further purchases of low phosphorus iron are noted. The same buyer who took 6000 tons, for April-December shipment, reported last week, has taken a further tonnage, understood to be a like amount, at a price equal to $22.50, delivered here. A further sale has been made to parties outside the district at a price equal to $22.75 here, and makers are not inclined to book further business at less than this figure. The general tone of the market is very strong and, while there has probably been a little less buying, consumers are placing moderate tonnages for early 1910 delivery when such shipments can be obtained. Purchases for second quarter shipment would also be made if sellers were willing to accept such business. For delivery in buyers' yards, eastern Pennsylvania and nearby points, during the next five months, the following quotations are named for standard brands:

Eastern Pennsylvania, No. 2 X foundry	$19.00 to $19.50
Eastern Pennsylvania, No. 2 plain	18.50 to 19.00
Virginia, No. 2 X foundry	19.00 to 19.50
Virginia, No. 2 plain	18.50 to 19.00
Gray forge	17.75 to 18.00
Basic	
Low phosphorus	22.75 to 23.00

Ferromanganese.—Very little inquiry has developed in this particular territory, although some fairly good sized lots are being asked for by consumers in the West. Sellers have somewhat higher ideas regarding prices, and while nominal quotations for first half of next year range from $44.50 to $45, Baltimore, some sellers talk about $1 advance.

Billets.—Greater activity in the demand is observed. Eastern mills, however, have about sold their output for the next few months and refuse business for such delivery. Heavier sales at higher prices, for the first quarter of 1910 are reported. Several round lots of ordinary rolling steel, including one of 5000 tons, were sold at $30.60, delivered in this vicinity, for shipment during the early portion of next year, and considerable further inquiry is reported, buyers appearing to be anxious to cover for their requirements even for a more extended period. Forging billets are in good demand and are quoted $2 to $3 higher than ordinary steel, dependent on conditions and grade.

Plates.—The demand continues heavy, particularly business originating with the railroads. Large tonnages are required by the car builders, while orders come in freely from all classes of consumers. Mills in this territory are running at full capacity and, in instances, have exceeded largely during the past few months the output made during the corresponding period in 1907. Deliveries are steadily hardening and prices for prompt delivery are on a somewhat higher level. Tonnage for first quarter shipment is being taken in a conservative way at prices ranging from 1.75c. to 1.80c. For reasonable deliveries on desirable business 1.70c. might be done, but it is next to impossible to get early shipments at any lower range.

Structural Material.—Mills are still actively engaged and prompt deliveries are hard to obtain. Large tonnages are in sight from car builders; several small bridge orders have been placed, and the contract for the Fidelity Building, in Baltimore, is understood to have been awarded to a

local fabricator. Miscellaneous business comes out in good volume, and, while there has been a slight lull in buying in some directions, the undertone of the market is exceedingly strong. Prices are very firm, quotations for plain shapes ranging from 1.70c. to 1.75c., delivered in this territory, with mills still refusing to accept business for extended 1910 shipment.

Sheets.—A large volume of business is being offered, and makers, who now have order books about filled for this year, are in pretty comfortable shape. For prompt shipment sharp advances are obtained, $2 to $3 a ton above prices for which orders for reasonable deliveries are taken. Producers have the situation well in hand and are not disposed to accept fresh business, their production for the next few months being taken by regular customers. Prices for reasonable delivery in this territory range about as follows: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—There is a fair volume of business coming out, particularly for refined iron bars, as deliveries on steel bars are hard to get, a number of makers being practically out of the market as far as new orders for this year's delivery are concerned. Prices for steel bars are firm at 1.65c., delivered in this territory; refined iron bars show a slight advance, 1.62c. to 1.70c. being named for reasonably early delivery, dependent upon tonnage and specifications.

Coke.—The situation is unchanged; prompt coke is not very plentiful, and makers ask higher prices than consumers are willing to pay for extended shipment. Transactions, therefore, have not been very extensive. Small lots of foundry coke have been sold at prices ranging from $2.75 to $3 per net ton at ovens. Furnace coke has not been active. Quotations for 1910 delivery hover close around $3 at oven. For delivery in this vicinity during the balance of the year the following quotations have been named:

Connellsville furnace coke	$5.00 to $5.25
Foundry coke	5.10 to 5.25
Mountain furnace coke	4.65 to 4.85
Foundry coke	4.70 to 4.85

Old Material.—The market is decidedly easier, and prices on some grades show a slight decline. The lull, however, is believed to be but temporary. The associated heavy melting steel consumers report that they are receiving good supplies of scrap; outsiders, however, now refuse to pay over $18.25, delivered, for that grade of old material. It has been definitely decided that the cargo of foreign crop ends brought in by the Winnie is to be admitted at the $1 rate of duty. Local customs officers claim that every lot of imported scrap will have to stand on its own merits as regards classifications, but it is believed that the rulings will not be excessively rigid where it is known that the material is going to mills for remelting. Sales during the week have been rather light, in some grades not enough business being transacted to establish a market. Prices, while to some extent nominal, range about as follows for prompt deliveries in buyers' yards, eastern Pennsylvania and nearby points:

No. 1 steel scrap and crops	$18.00 to $18.25
Old steel rails, rerolling	19.00 to 19.50
Low phosphorus	22.00 to 22.50
Old steel axles	24.00 to 25.00
Old iron axles	30.00 to 31.00
Old iron rails	21.00 to 22.00
Old car wheels	17.50 to 18.00
Choice No. 1 R. R. wrought	21.00 to 21.50
Machinery cast	17.50 to 18.00
Railroad malleable	17.00 to 17.75
Wrought iron pipe	17.25 to 17.75
No. 1 forge fire scrap	16.50 to 17.00
No. 2 light iron	10.75 to 11.25
Wrought turnings	15.00 to 15.50
Stove plate	14.00 to 15.00
Cast borings	13.00 to 13.50
Grate bars	14.50 to 15.00

The German Iron Market.

BERLIN, October 21, 1909.

The event of chief interest in the iron market the past week has been the further advance of pig iron and sheet prices on the Düsseldorf Exchange in the fortnightly trading on Friday. The following changes in prices were noted: Siegerland puddling, 55 to 58 marks, against 55 to 57 on October 1; steel-making iron, 58 to 60 marks, against 57 to 60; German Bessemer, 59 to 61 marks, against 58 to 61; Luxemburg foundry No. 3, 49 to 50 marks, against 48 to 50; German hematite, 59 to 61 marks, against 58 to 60; thin sheets, 125 to 130 marks, against 123 to 130.

Otherwise the market has been rather devoid of new features. No further advances in prices on the part of trade combinations have been reported, but within a week or two various organizations will meet to fix their next year prices. The Wire Rod Association meets next week for that purpose. The Steel Syndicate will also soon give out its new prices. It is reported that the sentiment within the organization is drifting in favor of raising the prices of semimanufactured products, and there is a manifest anxiety among consumers lest this be done. The independent trade press is arguing that an advance would be a great mistake, since the prices of finished products are not yet high enough to afford a fair profit to many of the works that have to buy their material. This is the case with bars, notwithstanding the fact that their price has improved considerably within the past three months.

The projected organization of the bar trade seems to be meeting with greater obstacles than were expected about the beginning of the month. It is pointed out that the big mixed products establishments in the syndicate will be slow to surrender the advantage which they derive from having a free hand in respect to bars in times of business depression, such as we have just been going through, when they were able to keep their mills fairly well employed by increasing their output of bars. This, of course, demoralized the trade, and the independent producers of bars—that is, those not producing their own supplies of steel material—were the chief sufferers.

A report on conditions in the Silesian District shows that the trade is on a satisfactory basis. All the works are well employed and old orders are being worked off at a normal pace. Building operations have become pretty brisk and promise still greater activity later on, and this has much improved the market for structural shapes. The demand for beams is active. Foreign markets are also sending in good orders. This is also true of semifinished products in general, on which prices are firm. Buyers who are trying to make engagements for supplementary amounts of steel for the current quarter, to be delivered within short periods, are meeting with difficulty in getting accommodation, since the rolling mills mostly insist upon four to six weeks for delivery. The stocks in their hands are low.

There is a marked tendency among the big companies of the West, many of which have been adding improvements on a large scale during the past two years of depression, to raise new capital to pay for those improvements. Only recently the Deutsch-Luxemburg Company made a considerable addition to its capital; and now the Rombacher Hüttenwerke, one of the biggest companies in Lorraine, is about to raise $1,200,000, after having raised nearly $1,700,000 only last year. Its capital, after the present increase, will amount to $10,700,000.

Germany's exports of iron and iron manufactures during the first nine months of the year, not including electrical and other machinery, amounted to 2,879,000 metric tons, as compared with 2,804,000 during the parallel period of 1908. Imports, on the other hand, dropped from 430,000 to 334,000 tons. Exports of electrical and other machinery reached 335,500 tons, against 367,000 tons, while imports were 58,700 tons, against 69,000 tons.

Cincinnati.

CINCINNATI, OHIO, November 27, 1909.—(*By Telegraph.*)

A feature of the local situation in iron and steel circles is the firm and steady tone of the markets and a rapid advance toward reconstruction of the few weak spots. All necessary details looking to the placing in commission of the only idle furnace stack in this section have been completed, and to-day the sale of the Steel Foundry Company's plant to R. L. Barrett of Philadelphia is confirmed by the insolvency courts. This property, idle two years, is expected to be placed in operation by the first of the year. The $75,000 obtained by Wm. B. Melish, receiver, is to be paid $10,000 cash, $10,000 in six months, $15,000 in one year, $20,000 in 18 months, and the remainder within two years. Deferred payments act as mortgage on the property, and any failure to meet them cancels the mortgage and restores the plant to the receiver. The purchaser is required to keep $80,000 insurance on the plant at all times.

Pig Iron.—Foundry grades have been the leader, and the purchase by an Ohio pipe interest of 36,000 tons for first half requirements was the principal transaction of the week. Of this 12,000 tons was Virginia iron, Nos. 2, 3 and 4 foundry, at a combination price, and aside from 8000 to 10,000 tons bought of nearby furnace interests the remaining tonnage is supposed to have been negotiated direct and with Valley or northern Ohio interests. Malleable is the strongest iron in to-day's list, not fewer than five large manufacturing interests asking prices for good sized tonnages. A Michigan consumer wants 500 to 1000 tons to fill out underestimated requirements. The northern Ohio interest in the market last week is said to be still seeking. A central Ohio concern wants 2000 tons for first quarter, and a Missouri interest seeks 3000 tons for the first half. Two large melters in Chicago territory bought over 10,000 tons through a local agency for next year. Charcoal irons have also been in demand and standard Southern has sold on the basis of $22, furnace. Dealers are anticipating some business very soon from concerns known to have covered for only the first quarter requirements. Northern irons are strong, and all save one interest in the Ironton District seem to be holding firm at $17.50, furnace. This one is still willing to sell for this year at $17. No statement is made as to what the reorganized Hamilton Iron & Steel Company will do in the matter of prices, but it is believed that the new owners will be quite as conservative as the old were at least, and

the Cincinnati sales agency is not apt to be changed. Basic is believed to be rather well cleaned up; sales have been light during the week. The pipe companies have cleaned out low grade foundry irons pretty thoroughly and the price is stronger relatively at $13.50 to $13.75, Birmingham, for forge, than No. 2 foundry at $15. Directors of the Southern Iron & Steel Company passed through here to-day en route from inspection of their properties. For prompt shipment and delivery over the balance of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote as follows:

Southern coke, No. 1 foundry	$18.25 to $18.75
Southern coke, No. 2 foundry	17.75 to 18.25
Southern coke, No. 3 foundry	17.25 to 17.75
Southern coke, No. 4 foundry	16.75 to 17.25
Southern coke, No. 1 soft	18.25 to 18.75
Southern coke, No. 2 soft	17.75 to 18.25
Southern gray forge	17.00
Southern mottled	16.75
Ohio silvery, 8 per cent. silicon	20.20
Lake Superior coke, No. 1	18.70 to 19.20
Lake Superior coke, No. 2	18.20 to 18.70
Lake Superior coke, No. 3	17.70 to 18.20
Standard Southern car wheel	24.75 to 25.25
Lake Superior car wheel	21.75 to 22.25

(*By Mail.*)

Coke.—The shortage of box and stock cars noted last week is intensified this week, and shippers, particularly in the Pocahontas and Connellsville regions, are much concerned. The labor situation seems a little easier. Furnaces are all calling for their maximum shipments on contracts, and some of them are asking for additional tonnages, which increases the confusion. For spot Connellsville furnace grades the price is $2.90 to $3 per net ton at oven and on contract the same. Connellsville foundry brands are firm at $3 to $3.10 for spot and on contract $3.30 to $3.50. The Wise County product is running about the same, as are also the Pocahontas grades. Foundries are evidently anticipating a higher market, for they are buying, although being well covered for the greater part of next year with much lower priced coke.

Structural Material.—Jobbers are getting 2c. as the minimum on structural material, and mill deliveries on material ordered now are not promised earlier than some time in January. There is still a good demand for twisted steel bars for concrete building, and these are sold out of stock at about 2.20c. for ¾ in. and larger. Mills are not quoting for extended delivery.

Bars.—Mill deliveries are hardly obtainable before February, and the price is described as firm at 1.65c., Cincinnati, for medium and small lots, with 1.90c. asked for small lots from store. Iron bars are firmer and about the best that can be done is 1.60c., local mill, but 1.55c. has been done during the week on a small tonnage of a special size. Dealers are asking 1.90c. for small lots from stock.

Sheets.—Independent interests in this market are asking and getting $2 a ton better than the quoted basing price, and deliveries are from four to six weeks behind. Buyers are evidently putting in orders for as much as they can get from such producers as can give them reasonably early delivery, and this is particularly true of galvanized sheets. The absolute minimum is 3.50c., Cincinnati, on No. 28 galvanized; 3.60c. to the less than carload buyer. On black No. 28 the local market is 2.50c. to 2.60c., Cincinnati, according to deliveries. Corrugated roofing sheets are quoted at $1.80 per square, Cincinnati, for painted and $3 for galvanized, 2½-in. corrugations, as against $1.60 and $2.85, Pittsburgh.

Old Material.—Dealers differ as to the condition of the market on scrap. A careful investigation into conditions indicates that the demand has quieted down considerably under the pressure of the high prices asked. There is no advance in prices, and if anything the market is a trifle weaker. Railroad offerings in this territory are light. The demand for rolling mill scrap has subsided considerably. For delivery in buyers' yards, Cincinnati and southern Ohio, the market is about as follows:

No. 1 R. R wrought, net ton	$14.50 to $15.00
Cast borings, net ton	8.50 to 9.00
Heavy melting steel scrap, gross ton	16.00 to 17.00
Steel turnings, net ton	9.50 to 10.00
No. 1 cast scrap, net ton	14.50 to 15.00
Burnt scrap, net ton	10.50 to 11.00
Old iron axles, net ton	19.00 to 19.50
Old iron rails, gross ton	18.50 to 19.00
Old steel rails, short, gross ton	15.50 to 16.00
Old steel rails, long, gross ton	16.50 to 17.00
Relaying rails, 56 lb. and up, gross ton	22.50 to 23.00
Old car wheels, gross ton	15.50 to 16.00
Low phosphorus scrap, gross ton	18.00 to 19.00

The regular monthly meeting of the Pittsburgh Foundrymen's Association was held on the evening of November 1, at the Fort Pitt Hotel, Pittsburgh. Ellsworth M. Taylor, of Pouche, Nevin & Co., New York City, addressed the meeting on the subject of "The Importance of Scientific Methods for Figuring Costs."

Cleveland.

CLEVELAND, OHIO, November 2, 1909.

Iron Ore.—Many of the larger consumers of Bessemer ore have come into the market in the past few days and secured reservations for their next year's supply. Fearing a possible shortage of such ore next season, furnacemen are showing considerable anxiety about the matter, and, yielding to the buyers' wishes, the ore firms are making the desired allotments, although they would prefer to have consumers hold off until after this year's shipments are cleaned up. Practically all the Bessemer output of one leading merchant ore firm has already been reserved and large tonnages have been allotted by other shippers. No action has been taken as yet regarding prices, but the furnacemen are being told in reply to their inquiries that an advance of 50 cents a ton will doubtless be made on all grades of ore. Everything now points to an early buying movement for next year. Ore firms expect that actual sales will begin early in December and that a heavy tonnage will be sold before the end of the year. In 1907 the buying movement started the first week in December, but in the past two years the market has not opened up until well along in the spring. In view of the expected early buying movement it is very probable that the ore firms will definitely fix next year's prices before the end of this month. The ore movement is now very heavy and will continue so as long as the weather permits. Some of the shippers will be pushed hard to get down all their sold tonnage before the close of navigation. Owing to the delay caused by storms, October shipments are expected to show a considerable falling off as compared with the two previous months, although the figures are not yet available. On November 1 the carrying charges on ore for the balance of the season were advanced 10 cents a ton from all upper lake ports, putting the rates back to where they were before the reduction at the opening of the season in 1908. It is expected that the advanced rates will prevail next season. Shippers, however, are pretty well covered, so that not much chartering is expected at the advanced rates for the balance of the season. Prices at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, $4.50; Mesaba Bessemer, $4.25; Old Range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—A local furnace reports the sale of a small tonnage of No. 1 foundry at $18.50, at furnace, for first half delivery, and several sales of small lots were made in the Valley at $17.50 for No. 2 for the first quarter and first half delivery. A number of sales of small lots of off iron are also reported. Local furnaces are adhering to the price of $18, at furnace, for No. 2 foundry iron for any delivery. A meeting of the Bessemer Pig Iron Association was held in Cleveland last week, and it is understood that the sentiment of the members is against any further advance in Bessemer at the present time. Some producers outside of the association are asking higher prices for Bessemer, ranging from $19.25 to $20. Basic iron is quoted at $17.50 for the first quarter. We note the sale of a 2000-ton lot of basic by a local furnace for delivery through the entire first half at $18, at furnace. For the balance of the year we quote delivered, Cleveland, as follows:

Bessemer	$19.90
Northern foundry, No. 1	$18.65 to 18.90
Northern foundry, No. 2	18.15 to 18.40
Northern foundry, No. 3	17.65 to 17.90
Southern foundry, No. 2	19.35
Gray forge	17.15 to 17.40
Jackson County silvery, 8 per cent. silicon	20.55

Coke.—The market is rather quiet, but prices are firm. Some contracts for foundry grades are being closed. We quote standard Connellsville furnace coke at $2.75 to $2.85 per net ton at oven for spot shipment, and $2.90 to $3 on contract for the first half. Connellsville 72-hour foundry coke is held at $3.25 for spot shipment and $3.25 to $3.50 for the first half.

Finished Iron and Steel.—Specifications for all lines of finished material continue heavy and deliveries show no improvement. Prices show a stiffening tendency. Steel bars are very firm, at 1.45c. to 1.50c., Pittsburgh, for orders accompanied by specifications, and some contracts are being made for first quarter delivery at the lower price. The demand for plates continues heavy and local mills are getting a good volume of orders at 1.60c., Pittsburgh, which has been their minimum price for several weeks. Mill agencies are now generally adhering to this price for any delivery. The demand for iron bars shows considerable improvement. Large orders are coming in from the railroads and considerable business is now coming from manufacturers, who are buying iron bars to take the place of steel bars because of the scarcity of the latter. Local mills have advanced their prices on iron bars to 1.70c., but this price would be shaded $1 a ton on desirable orders and on sizes on which early deliveries can be made. On the larger sizes the local mills are filled with orders for several weeks. We quote iron bars at Toledo mill at 1.55c. for the balance of the year and 1.55c. to 1.60c. for the first quarter. The demand for structural material has eased up somewhat, but there is considera-

ble new work in sight in building lines, for which contracts will be placed during the winter. The demand for sheets continues heavy, particularly for blue annealed, and the fact that mills are getting further behind on deliveries has resulted in an increase in warehouse orders. Local jobbers report that October was the largest month in their history in warehouse business. One leading jobber has advanced prices out of stock $2 a ton on steel bars, plates, shapes and sheets, now quoting bars at 1.90c. and plates and shapes at 2c. We note the sale of 500 tons of standard section rails to a local concern for industrial purposes. The demand for shafting is good and prices are firm.

Old Material—The demand for all grades has been light. Mills have bought quite heavily and have large stocks on hand and do not seem disposed to take on any more at present. Owing to the inactivity of the market prices have eased up somewhat. A decline of 25 cents a ton is noted in quotations on heavy melting steel. Other prices remain about stationary, with the exception of cast scrap, which has advanced 50c. a ton. Although the demand for this grade is less active, dealers are holding firmly to prices ranging from $15.50 to $16.25 for No. 1 cast. The railroad offerings this week include the usual tonnage from the Erie and Pennsylvania Lines West, whose lists will close November 3. Prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$17.50 to $18.00
Old iron rails	20.50 to 21.00
Steel car axles	20.50 to 21.00
Old car wheels	17.50 to 18.00
Heavy melting steel	16.75 to 17.25
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	15.00 to 15.50
Railroad malleable	17.00 to 17.50
Light bundled sheet scrap	11.50 to 12.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.50 to $22.00
Cast borings	9.00 to 9.25
Iron and steel turnings and drillings	11.00 to 11.25
Steel axle turnings	12.00 to 12.50
No. 1 busheling	14.50 to 15.00
No. 1 railroad wrought	17.25 to 17.50
No. 1 cast	15.50 to 16.00
Stove plate	12.50 to 13.00
Bundled tin scrap	11.00 to 11.50

Buffalo.

BUFFALO, N. Y., November 2, 1909.

Pig Iron.—The total of transactions for Buffalo District furnaces in all grades for the month of October was very heavy. Sales for the last week of the month for this producing district were 25,000 tons to tributary territory, with a large tonnage of sales to outlying districts and a liberal amount still under negotiation, making an aggregate of at least 60,000 tons of sales and transactions under negotiation for the week, a large proportion being for 1909 shipment. The situation as to prices is very strong, as indicated by the fact that so many furnaces are sold up and practically out of the market. In some instances, however, where prompt delivery iron is involved and the grades required are such as fit in with the furnace's ability to deliver, slight concessions have been made from the price schedule quoted below. In basic the market is exceedingly firm and slightly higher, with a very limited supply obtainable, steel making iron being pretty well cleared up in this district and the leading producer heavily sold ahead. We quote as follows, per gross ton, f.o.b. Buffalo, for this year and first quarter deliveries:

No. 1 X foundry	$17.00 to $17.50
No. 2 X foundry	16.75 to 17.25
No. 2 plain	16.50 to 17.00
No. 2 foundry	16.25 to 16.50
Gray forge	16.00 to 16.50
Malleable	17.50 to 18.00
Bessemer	19.00 to 19.50
Basic	18.00 to 18.50
Charcoal	20.25 to 21.00

Finished Iron and Steel.—The demand for bar material continues very strong, with a growing scarcity, the best deliveries obtainable being from three to four months from mills. The inquiry for plates and shapes is fair, with an easier situation as to deliveries from mills, shipments in six to eight weeks being readily obtainable. Prices remain firm, the minimum for steel bars being 1.50c., Pittsburgh, for carload lots, and 1.55c. and 1.60c. for less than carload lots; plates and shapes, 1.60c., Pittsburgh, in carload lots from mills. In structural lines the demand has slackened materially, although figures are being asked on a number of small building projects to be put through this season. The Wurtz & Son Iron Works has received contract for steel for the Co-operative Amusement Company's theater, Buffalo, about 100 tons, and for a gas producer house for the Gould Coupler Company's works, Depew, N. Y., for a like amount. Also contract for fabricating and erecting structural steel for the new water works pumping station, Buffalo, 1200 tons, for which the steel will be furnished by the Jones & Laughlin Steel Company. The Buffalo Structural Steel Company has received contract for steel for the Frederick Z. Phelps factory building on Niagara street, and contract for structural and ornamental iron work for the Central Park Presbyterian Church, Buffalo, about 150 tons.

Old Material.—The market is decidedly easier and scrap appears to be quite plentiful. The Lackawanna Steel Company, on account of being flooded with scrap material coming in on contracts and inability to secure help for prompt unloading, has placed a temporary embargo on all shipments to its mills until the overcrowded condition is relieved. This tends to cause scrap material to accumulate quite rapidly in local dealers' yards, there being no immediate outlet to outside markets. Very quiet conditions prevail in all lines with the exception of machinery cast scrap and No. 1 railroad wrought, in which there is considerable activity. Prices remain firm. We quote as follows per gross ton, f.o.b. Buffalo:

Heavy melting steel	$16.00 to $17.00
Low phosphorus steel	21.00 to 22.00
No. 1 railroad wrought	18.00 to 18.25
No. 1 railroad and machinery cast scrap	17.00 to 17.50
Old steel axles	20.50 to 21.00
Old iron axles	26.00 to 26.50
Old car wheels	18.00 to 18.50
Railroad malleable	17.00 to 17.50
Boiler plate	14.50 to 15.00
Locomotive grate bars	13.00 to 13.50
Pipe	14.00 to 14.50
Wrought iron and soft steel castings	12.00 to 12.50
Clean cast iron borings	10.00 to 10.50
No. 1 busheling scrap	14.00 to 14.50

Birmingham.

BIRMINGHAM, ALA., November 1, 1909.

Pig Iron.—Furnaces report the most significant transactions in this market for some weeks, involving low grade foundry iron and basic metal. With the sale of this tonnage, which is for delivery prior to July 1, 1910, order books of the largest producing interests are in a very satisfactory condition. The output of practically all of the smaller producers is known to have been taken care of for some months in advance, and the present movement from all furnace yards is at a rate in excess of the production. With the exception of recent purchases by the leading melters, the trade generally is apparently disposed to defer engagements for additional 1910 deliveries. The demand is rather desultory and the past week's business represents a very limited number of purchases. Sellers have in no case offered inducements for trading in the shape of departures from the established quotation, and, with the disappearance of resale iron heretofore offered, have higher prices in view for spot shipments. For such grades below No. 4 foundry as are to be had for prompt delivery, or comparatively early shipment, a differential of 25c. per ton on the No. 2 foundry basis is asked by the majority of producers. The sale of 1000 tons of gray forge for shipment during November and December is reported at $13.50, Birmingham, but it is understood that additional tonnage could not be had from that source at the figures named. One or more small lots of white and mottled iron are being offered for prompt shipment, as is a small lot of No. 4 foundry. So far as is known merchant interests are not making efforts to dispose of their holdings at lower figures than are quoted by the furnace companies. The holdings of merchants and the tonnage in warrant yards have been materially decreased during the past month. By reason of the heavy sale of basic iron, referred to above, it is understood that one or more changes in operations at furnace plants will soon be made, although it is quite probable that the output of foundry grades will not be increased, inasmuch as preparations are being made for an addition to the active producing capacity.

Old Material.—Dealers' asking prices are revised and the market is reported fairly active. In one or more cases yards have been depleted and contracts are being filled by direct shipments. The demand for steel and wrought grades predominates. We quote dealers' revised asking prices as follows, per gross ton, f.o.b. cars here:

Old iron axles	$20.50 to $21.00
Old iron rails	16.50 to 17.00
Old steel axles	19.00 to 19.50
No. 1 railroad wrought	14.50 to 15.00
No. 2 railroad wrought	12.00 to 12.50
No. 1 country wrought	12.00 to 12.50
No. 2 country wrought	11.50 to 12.00
No. 1 machinery	13.00 to 13.50
No. 1 steel	12.50 to 13.00
Tram car wheels	12.00 to 12.50
Standard car wheels	14.50 to 15.00
Light cast and stove plate	11.00 to 11.50
Cast borings	7.00 to 7.50

Cast Iron Pipe.—The advance so far effected in the price of this material is not considered in full sympathy with the increased cost of raw materials, and local producers are not in all cases solicitous of additional orders. The outlook at this time is considered very favorable, but specifications have not been submitted for most significant tonnages to be placed. It is understood that in the North and East gas companies contemplate improvements and extensions that will require tonnages well up in round figures, while in the Middle West one will soon enter the market for 2000 tons of gas pipe. The contracts recently placed by small municipalities aggregate a fairly attractive tonnage

and the movement from all plants is practically equal to the make. We quote water pipe as follows, per net ton, f.o.b. cars here: 4 to 6 in., $26; 8 to 12 in., $25; over 12-in., average $24, with $1 per ton extra for gas pipe. These prices are firm for such small lots as are being offered, but could probably be slightly shaded for large municipal contracts.

The Birmingham Coal & Iron Company is preparing to operate its No. 1 furnace at the Vanderbilt plant. This stack has been operated during the past year at only such times as No. 2 was out of blast, by reason of the lack of necessary number of blowing engines.

The rolling mill of the North Alabama Rolling Mill Company at Sheffield, Ala., has been put in operation.

The Western Steel Car & Foundry Company, Anniston, Ala., will probably resume operations at its rolling mill within the next 30 days.

No. 1 furnace of the Alabama Consolidated Coal & Iron Company at Gadsden, Ala., has been put in operation after having been relined. No. 2 furnace at that plant has been blown out.

Metal Market.

NEW YORK, November 3, 1909.

Copper.—While we have been unable to confirm the report that the United Metals Selling Company sold 30,000,000 lb. of copper on Saturday, there is no doubt that some large transactions have taken place, sales of at least 15,000,000 lb. being traceable. These sales were largely to the brass industries and some of them were made on Monday. Late on Monday afternoon the expected announcement from the leading interest of a selling price was made and its declaration was to the effect that it would dispose of lake copper at 13.36½c. Other sellers, who take an optimistic view of the situation, are reported as selling for 13.25c. It was freely predicted in the trade a week ago that the leading sellers were preparing to close out some large orders at a lower price than they had been asking during the last six weeks, and at that time it was thought that a positive announcement of a selling price would follow these transactions. The reported large sales of Saturday and the subsequent announcement of Monday confirmed those beliefs. It is very apparent that copper is on a firmer basis, and if the prices asked continue reasonable inquiries denote that some good trading will be done within the next few weeks. We know of sales of electrolytic copper which had been offered under 13c. two weeks ago that were made last Saturday on the basis of 13c., delivered in the Naugatuck Valley under 30 days, and there are inquiries out which indicate that more copper would be taken on that basis. The forthcoming report of the Producers' Association is looked forward to eagerly, and the general impression is that the figures will be favorable. We quote copper at 13.25c., electrolytic at 12.87½c., and casting copper, which is still rather scarce, at 12.75c. There have been some good sales of copper in London, and on Monday 400 tons were sold there. Well informed people think that the sale was to consumers rather than speculators. To-day 500 tons of spot copper and 1300 tons of futures were sold in London on the basis of £57 0s. 5d. for spot and £58 17s. 6d. for futures. The market was easy.

Pig Tin.—The week was dull until Friday, when, as far as the sellers were concerned, another good Friday occurred. The reason for this was that it was thought before Friday that the consumption of October tin would amount to about 3000 tons, but news came on that day that the sales for the month would amount to more than 4000 tons, and this resulted in something of a boom in the tin market, as compared with the selling of the last few months. It is estimated that about 700 tons of tin were sold during the day and its effect on the market can be seen by the following table of the week's prices:

	Cents.
October 27	30.45
October 28	30.40
October 29	30.37½ to 30.45
November 1	30.60 to 30.65
November 3	30.40

That the estimates of large deliveries into consumption during October made on Friday were conservative, to say the least, is indicated by the following monthly statistics compiled by C. Mayer, secretary of the New York Metal Exchange: "Deliveries into consumption during October were very large, amounting to 4100 tons. The total for 10 months shows an increase of 7050 tons, compared with the same time last year. . . . Shipments from the Straits for October were 965 tons smaller than for the same month of last year. For the 10 months of this year the decrease in shipments amounts to 2429 tons, compared with the same time last year. . . . The total visible supply October 31, 1909, was 1200 tons above that of October 31, 1908." The market in London was easy to-day and 100 tons of spot tin was sold at £138 2s. 6d. and sales of 250 tons of futures were made at £140, 2s. 6d.

Tin Plate.—The heavy demand for tin plate continues, can manufacturers and the building trades being the principal buyers. Stocks are still scarce, but prices have not as yet changed. Sellers are asking $3.75 for 100-lb. I C coke plates.

Lead.—Lead is firmer, although there is no great demand. Both the American Smelting & Refining Company and outside interests are quoting 4.40c., New York. In St. Louis the market is stronger and 4.25c. is the bottom price.

Spelter.—Some good sales of spelter were made during the week. The galvanizing interests are buying heavily and the market is firm at 6.30c. In St. Louis spelter is quoted at 6.10c., and some sellers are asking as much as 6.15c.

Antimony.—Antimony is plentiful and only small sales are being made. Prices are unchanged, with Hallett's at 8.25c., Cookson's at 8.30c., and other brands at 7.75c.

Aluminum.—There has been a drop in the price of finished aluminum, such as rods, wire and sheets. Ingot aluminum remains at 24c., but rod and wire aluminum can now be had at 31c., and the base price of sheet aluminum is 33c.

Old Metals.—The market is firm at the following dealers' selling prices:

	Cents.
Copper, heavy cut and crucible	12.75 to 13.00
Copper, heavy and wire	12.25 to 12.50
Copper, light and bottoms	11.50 to 11.75
Brass, heavy	9.00 to 9.25
Brass, light	7.25 to 7.50
Heavy machine composition	11.75 to 12.00
Clean brass turnings	8.25 to 8.50
Composition turnings	9.50 to 9.75
Lead, heavy	4.20 to 4.25
Lead, tea	3.90 to 3.95
Zinc scrap	4.15 to 4.25

New York.

NEW YORK, November 3, 1909.

Pig Iron.—While the foundry iron market has quieted down somewhat, there has been a steady run of orders, and sales ranging from 500 tons to one of 3000 tons are reported. New England and New York buyers have quite generally taken iron for the first quarter, and some inquiries cover the first half of the year. We quote New York prices as follows: Northern No. 1 foundry, $19 to $19.50; No. 2 foundry, $18.50 to $19; No. 2 plain, $18 to $18.50, all for delivery this year. Alabama irons are firm at $15, Birmingham, or $19, New York.

Steel Rails.—No announcement is made of the distribution of the 165,000 tons of rails which the New York Central Lines are to take in their first contracts for 1910. Eastern mills have considerable rolling space open for the next three months and the outlook is not as bright for filling it as might be inferred from recent reports of important contracts by large systems. The Great Northern is in the market for rails for next year, its inquiry calling for "10,000 to 40,000 tons," though several mills may be awarded orders within that range. In the past week frog and switch companies have been buyers from Western and Central Western mills.

Structural Material.—Eastern fabricating business is lighter than in several months, though the prospect is reported good for bridge work for which railroads are preparing plans for next year. The counties of Hudson and Essex in New Jersey will unite in the building of a Scherzer lift bridge in connection with the Newark Plank Road improvement now under way. The Pennsylvania Steel Company was low bidder on the highway bridge between Benwood, W. Va., and Bellaire, Ohio, but the figure is above the amount contemplated in engineers' estimates, and there will probably be a readvertisement. Prices realized on plain material are generally above the 1.50c. Pittsburgh level, on which large contracts could no doubt still be placed. More and more demand is made upon warehouse stocks. We quote tidewater deliveries, mill shipments, at 1.66c. to 1.76c., while material cut to length is sold from stock at 2c.

Ferroalloys.—Large sales of ferromanganese are being made and there are some good inquiries in the market. Some sellers are quoting ferromanganese for delivery over the first half of next year at $45 and for delivery the last half of the year at $45.50 to $46. One sale is reported for delivery over the last half of next year at $45.50. Ferrosilicon is weaker and not in great demand. Prices made in New York are from $62 to $63.

Bars.—The market is firm, with the bulk of the business going to manufacturers of bar iron on account of the continued pressure on the steel bar mills which are unable to promise reasonably early delivery. Quotations on iron bars range from 1.65c. to 1.75c., tidewater, according to quality, quantity and character of specifications. Steel bars are quoted at 1.66c. to 1.71c., tidewater.

Cast Iron Pipe.—Orders for early delivery are sufficiently numerous to make an excellent aggregate. While most of these orders are small, they occasionally run as high as 500 tons. Although the founders are becoming increasingly firmer in their views, a limited number are apparently desirous of securing more business and for this reason a

lower price is sometimes quoted than the level recently attained on most transactions. Competition of this kind is especially noted on business coming up in the interior of this State. Thus an order for about 500 tons was recently placed at $23.35, delivered at a Hudson River point, but the order included a considerable proportion of large sizes. The inquiry for next year is not so strong as it was a week or two ago. Gas companies appear to be most inclined to anticipate their next year's requirements, but so far the great gas companies in this immediate vicinity have shown no indication of coming into the market. The Eastern demand for water pipe for next year will probably not develop until toward spring, as the New England municipalities hold their elections in the spring months and the placing of contracts may be deferred until the new municipal officers are then chosen. Carload lots of 6-in. continue to be quoted at $25.50 minimum, per net ton, at tidewater.

Old Material.—Heavy melting steel scrap is weak as a result of the rapidity with which deliveries have been made to eastern Pennsylvania steel works on recent contracts. These consumers have grown much more critical and numerous rejections have been made, with accompanying demands for a reduction in price. Not only have importations of steel scrap been quite heavy at Philadelphia, but considerable quantities have come into the Eastern market from the South and other sections of the country, greatly augmenting the visible supply. While this has led to a condition of weakness, dealers have not lost confidence in the future of the market. They believe that, although prices may sag for a time, the situation will correct itself with the advance of winter, partly because cold weather will diminish the offerings of the railroads, partly because car shortage, which will interfere with deliveries, is becoming more pronounced, and, what is more influential, because the steel works are crowded with business and their consumption will increase rather than diminish. Some demand for rolling mill stock is observed, but even in this line consumers generally seem to be well stocked and ordinary grades of old material are, therefore, weaker, although specialties, such as selected railroad wrought, hammered iron car axles and steel axles, are firm. Cast borings are likewise well held. The demand for cast scrap for foundry use is excellent and prices are maintained. Quotations are as follows per gross ton, New York and vicinity:

Rerolling rails	$16.00 to $16.50
Old girder and T rails for melting	15.00 to 15.50
Heavy melting steel scrap	15.00 to 15.50
Relaying rails	22.00 to 22.50
Standard hammered iron car axles	24.50 to 25.00
Old steel car axles	21.50 to 22.00
No. 1 railroad wrought	18.00 to 18.50
Wrought iron track scrap	16.00 to 16.50
No. 1 yard wrought, long	16.00 to 16.50
No. 1 yard wrought, short	15.50 to 16.00
Light iron	10.50 to 11.00
Cast borings	10.50 to 11.00
Wrought turnings	12.00 to 12.50
Wrought pipe	14.00 to 14.50
Old car wheels	15.50 to 16.00
No. 1 heavy cast, broken up	15.50 to 16.00
Stove plate	13.00 to 13.50
Locomotive grate bars	12.50 to 13.00
Malleable cast	16.00 to 16.50

Iron and Industrial Stocks.

NEW YORK, November 3, 1909.

Activity in industrial stocks changed to some extent from United States Steel Corporation securities to those of the railroad equipment companies, in some of which new high records were made. The range of prices on active iron and industrial stocks from Thursday of last week to Monday of this week was as follows:

Allis-Chalm., com.	14¼- 15⅞	Pressed St., pref.	107 -108⅞
Allis-Chalm., pref.	50⅞- 53⅝	Railway Spr., com.	46⅜- 50¾
Beth. Steel, com.	32 - 35	Republic, com.	45 - 47⅞
Can. com.	11⅞- 12½	Republic, pref.	104 -106⅞
Can. pref.	82 - 82⅞	South. I. & S., pref.	49¼- 50
Car & Fdry. com.	69⅝- 75⅜	Sloss, com.	91½- 92½
Car & Fdry. pref.	118½-119½	Pipe, com.	31⅜- 32¾
Steel Foundries	60⅛- 65	Pipe, pref.	81¾- 85⅞
Colorado Fuel	45 - 48⅛	U. S. Steel, com.	88¾- 91⅛
General Electric	162½-164	U. S. Steel, pref.	127 -128½
Gr. N. ore cert.	79½- 82½	Westinghouse El.	85 - 87⅛
Int. Harv., com.	99¼-105	Va. Iron, C. & C.	70 - 71¾
Int. Harv., pref.	124½-125¼	Chi. Pneu. Tool	36 - 39½
Int. Pump, com.	48¾- 51	Cambria Steel	45½- 46⅞
Int. Pump, pref.	88¼- 90¼	Lake Sup. Corp.	27¼- 28
Locomotive, com.	59 - 64	Penn. Steel, pref.	116½
Locomotive, pref.	115 -116	Warwick	11⅝- 11⅞
Nat. En. & St., com.	20⅜- 21½	Crucible St., com.	13¾- 14⅛
Nat. En. & St., pref.	97	Crucible St., pref.	83½- 83⅞
Pressed St., com.	49 - 53⅞		

Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 90⅝, preferred 128, bonds 105⅜; Car & Foundry common 76, preferred 119⅞; Locomotive common 63¾, preferred 116; Steel Foundries 65½; Colorado Fuel 47⅝; Pressed Steel common 55, preferred 107¼, ex-dividend; Railway Spring common 51; Republic common 47¼, preferred 106½; Sloss-Sheffield common 92; Cast Iron Pipe common 33⅜, preferred 86; Can common 12⅛, preferred 82¼.

The stockholders of the Crucible Steel Company of America at their annual meeting October 20 adopted the following amendments to the certificate of incorporation of the company: "The corporation may also purchase or otherwise acquire, hold, sell, assign, conserve or otherwise dispose of shares of its own capital stock. Accumulated profits may be reserved and invested in shares of its own stock which the corporation has power to hold."

Chisholm & Chapman, 18 Wall street, New York, furnish the following quotations:

Iron and Steel Bonds.

	Bid.	Asked.
Bethlehem Steel 1st ext. 5s, due January, 1926	89	89¾
Bethlehem Steel purchase money 6s, August, 1998	117	..
Buffalo & Susquehanna Iron 1st 5s, June, 1932	..	99½
Buffalo & Susquehanna Iron deb. 5s, January, 1926	94	97¾
Dominion Iron & Steel 5s, July, 1929	96	..
La Belle Iron 1st 6s, December, 1923	103½	104½
Lackawanna Steel 1st 5s, April, 1923	..	98¾
Maryland Steel 1st 5s, February, 1922	102	..
Pennsylvania Steel 1st 5s, November, 1917	..	103
Pennsylvania & Maryland Steel 6s, September, 1925	..	110½
Republic Iron & Steel 5s, October, 1934	101½	..
Sloss Iron & Steel 1st 6s, February, 1920	107	..
Sloss Iron & Steel consol. 4½s, April, 1918	95½	..
Jones & Laughlin Steel 1st 5s, May, 1939	101¾	102¼
United States Steel Corporation.		
Collateral Trust 5s, Series A, C, E, April, 1951	114¾	115½
Collateral Trust 5s, Series B, D, F, April, 1951	114¾	115½
Sinking Fund 5s, April, 1963	105½	105⅝
Union Steel 1st 5s, December, 1952	104½	105¼
Clairton Steel 5s, 1908-1913	100	..
St. Clair Furnace 1st 5s, 1910-1939	100	..
St. Clair Steel 1st 5s, 1908-1926	100	..
Illinois Steel deb. 5s, January, 1910	100	..
Illinois Steel 5s, April, 1913	..	100⅞

All bonds quoted "and interest."

Dividends.—The United Wire & Supply Company declared a quarterly dividend of 1¾ per cent. on its preferred stock and a quarterly dividend of 1 per cent. on its common stock, payable November 1.

The Flannery Bolt Company, Pittsburgh, Pa., declared a quarterly dividend of $5 a share, payable October 30.

The Pressed Steel Car Company, Pittsburgh, has declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable November 24.

The General Motors Company has declared a stock dividend of 150 per cent., payable to common stockholders of record November 4 in common stock.

Pennsylvania Engineering Works Receives a Bethlehem Contract.

The Pennsylvania Engineering Works, New Castle, Pa., has received a contract from the Bethlehem Steel Company, South Bethlehem, Pa., for the erection of two 500-ton blast furnaces with their complements of 10 hot blast stoves, gas washers, downcomers, dust catchers, cast houses, &c., and also for a complete Bessemer steel plant to work in conjunction with the present open hearth steel plant. This latter combination will be used to work out the duplex process of steel making. The Bessemer end will consist of two 20-ton vessels, a 400-ton metal mixer, hot metal transfer and slag cars, mixer and converter buildings and bottom house complete, with crushers, grinding pans and drying ovens. All the work involved will take nearly a year for completion. The contract of the Pennsylvania Engineering Works on the Bessemer steel plant includes its putting in all foundations, together with the hydraulic system, blast piping, pulpits, &c.

The Studebaker E-M-F Company, South Bend, Ind., will build a $400,000 automobile plant at Walkerville, Ontario, Canada, to supply the trade of that country and other British colonies. It will be a subsidiary concern of the well known Detroit company, and it will be known as the E-M-F Company of Canada. Walter E. Flanders of Detroit will be president and Robert M. Brownson secretary-treasurer. The plant will have a capacity of 100 cars a day.

The American Sheet & Tin Plate Company now has all its sheet mills in full operation with the exception of the Aetna-Standard Works at Bridgeport, Ohio, which has been shut down since July 1 on account of the strike, with no effort made by the company to start it. All the serviceable tin plate plants owned by the company are also in operation to nearly full capacity, with the exception of the Laughlin and Labelle mills at Wheeling, which have also been idle since July 1, with no effort made to start them.

Customs Decisions.

Bronze Wire Cloth.

Wire cloth made from bronze wire is held by the Board of United States General Appraisers to be entitled to entry at the rate of 45 per cent., under the provision for manufactures of metal not specially provided for. The issue came before the board in the shape of a protest filed by James F. McCoy & Co., who objected to the assessment of 45 per cent. and 1¼ cents per pound as articles made from brass wire. The decision, finding in favor of the importer, states that it appears from the official record in the case that the bronze wire cloth is not directly dutiable under the provisions of Paragraph 137. It is not apparent to the board how recourse can be had to Section 7, which is the similitude clause of the tariff, in order to make it dutiable, since the cloth is made of metal. The board says: "We hold the merchandise dutiable under Paragraph 193 as claimed. The decision of the collector is modified."

Steel Wedge Bolts.

The board has reduced the duty imposed by the Custom House authorities on steel wedge bolts imported by the Michelin Tire Company, New York. Duty was assessed at 45 per cent. under the metal schedule, whereas the contention of the importers was that the merchandise should be admitted at 1½ cents a pound as "bolts of iron or steel."

Metal Foot Ball Boxes.

Metal foot ball boxes, which were returned for duty at 45 per cent. as manufactures in chief value of metal are held by the board to be toys with a rate of 35 per cent.

Nickel Plates.

Hermann Boker & Co. have been unsuccessful in the attempt to secure a lower duty on rectangular plates of nickel. The collector assessed duty on the merchandise at the rate of 45 per cent. under the provision in the Dingley ariff for articles of nickel wholly or partly manufactured not specially provided for. According to Boker & Co., the goods should be admitted to entry as nickel sheets with a customs tax of 6 cents a pound. It appears that the plates are 12 in. long, 8 in. wide and ½ in. thick. In overruling the protest, General Appraiser Fischer, in his decision for the board, holds that plates ½ in. thick cannot be regarded as either bars or sheets, as these words are used in the tariff. The general appraiser reaches the conclusion that the articles are nickel plates and are assessed properly. The collector's classification is upheld.

Gas Cylinders.

The board has upheld the importers as to the duty on large gas cylinders imported by Knauth, Nachod & Kuhne. The collector exacted a duty of 45 per cent. as manufactures of metal, while the importers contended for 35 per cent. as tubes. A somewhat similar claim by Hensel, Bruckmann & Lorbacher is sustained.

Steel Strips for Knives.

Owing to a defective claim on steel strips imported by Hermann Boker & Co., and intended to be used for knives, the board has been compelled to overrule a protest filed by the firm. The merchandise is described as arc-shaped pieces of tempered steel of specific dimensions upon which duty was assessed at the rate of 45 per cent. as articles of metal not specially provided for. The importers' contention was that the merchandise should be allowed to enter at 4.7 cents per pound under the provision in the Dingley tariff for sheets and plates and steel in all forms and shapes not specially provided for. The testimony showed that the goods are strip steel or sheet steel cut to a particular shape. The evidence laid before the board is to the effect that the merchandise is cut out of sheet steel in long lengths to the particular form in which it is imported. It is admitted that the articles are hardened and tempered. In overruling the protest, General Appraiser Fischer, in his decision for the board, says in part:

As we view these articles of steel, they are merely a form of strip steel and have not been made into anything else. The (collector's) assessment under paragraph 193 is in error. The merchandise is dutiable under the provisions of paragraphs 135 and 141, tariff act of 1897, rather than under paragraph 193. The claim in the protest that the articles are dutiable only at the rates provided in paragraph 135 is defective, for, as the strips or sheets are hardened or tempered, they are subject to the duty of 1 cent per pound provided in paragraph 141, in addition to the primary rate provided in paragraph 135. This claim does not appear in the protest, and the importers' claim therefore cannot be sustained. On the authorities referred to in the ruling of the board, we must regard the protest as insufficient, and we overrule the same. The decision of the collector will stand.

A Huge Atchison Locomotive.

The Baldwin Locomotive Works, Philadelphia, Pa., has just furnished the Atchison, Topeka & Santa Fé Railroad with one of the largest passenger locomotives ever built. It weighs 376,450 lb., without the tender, and 600,000 lb. with it. The length, including the tender, is 104 ft. 11½ in. The diameter of the driving wheels is 73 in., and of the boiler 72 in. The driving wheels are in two sets, the forward set and the rear set, each being driven by its own separate cylinders. The length of the firebox is 119⅝ in., and its width is 63¼ in. It will use oil as fuel, the oil tank capacity being 4000 gal. Following is a general description:

The firebox is of the Jacobs-Shupert patent, consisting of a series of plates corrugated vertically. There are no stay bolts except at the throat and back head. The fire tubes are 19 ft. in length. After passing through the fire tubes, the ignited gases pass through a superheater of the Santa Fé type, thence through a reheater. The superheater and reheater are placed in the intermediate combustion chamber. They then pass through a feed water heater before finally escaping through the smoke stack. The temperature of the feed water is raised to about 300 degrees F. Steam generated in the boiler passes first through the superheater, thence through the high pressure cylinders where its force is utilized to drive the rear set of driving wheels, thence through the reheater where it is revitalized, thence to the low pressure cylinders, where it is utilized to drive the forward set of driving wheels. After being exhausted from the low pressure cylinders it escapes through the smoke stack. The boiler is separable in front of the high pressure cylinders at which point the forward unit is also pivoted to the rear unit.

The Greatest Steel Plant in the World.—The articles descriptive of the great Gary Works of the Indiana Steel Company, subsidiary of the United States Steel Corporation, which have appeared in *The Iron Age* from time to time this year, have been reproduced in book form, making an impressive publication. Numerous illustrations enable the technical details to be more thoroughly comprehended. In connection with the descriptions of the various manufacturing departments, an account is given of the building of the city of Gary, involving the conversion of an uninviting waste of sand in northern Indiana to a modern municipality possessing all the improvements and advantages of old and highly developed communities. The publication is a most interesting presentation of a great achievement, which ranks with the most important undertakings of this age of engineering progress. It is offered for sale by the David Williams Company, 14 Park place, New York, at $1 per copy.

The manufacturing property of the Chelsea Stove & Mfg. Company, which the Detroit Trust Company, Detroit, Mich., is offering for sale, is not an idle plant, but has been kept running and producing, and is in operation at the present time. Few buildings of manufacturing establishments are to be found as substantially erected as these, no apparent effort having been made to save money in their construction and their appointments. By continued occupation they are being kept in good condition.

The Machinery Trade.

NEW YORK, November 3, 1909.

The demand for machinery was quite active the past week, several of the more important industrial companies coming into the market for considerable mechanical equipment. While no large lists of requirements were reported, the leading pump maker made quite heavy purchases and is understood to be contemplating the buying of a great deal more shortly. Inquiries calling for small lots of tools were numerous and orders of the same character came in in good volume. Both orders and inquiries came principally from the smaller and medium sized industrial plants, and merchants are much gratified at the steady buying from those sources, as it more clearly indicates a permanent betterment in industries using metal working machinery. An illustration of this is the active demand for tools in Buffalo, N. Y., and vicinity where, it is reported, the various companies are buying quite freely, though in small lots. One house reports more business at its Buffalo branch than for a long time. The railroads have not yet come into the market to any extent, though the New York Central continues to send out single tool inquiries every few days. The increased demand has caused the further extension of deliveries and this question is becoming a more and more perplexing one for merchants who represent manufacturers who, during the summer, had their order books well filled for machines for automobile plants. October was a much better month in the trade than September, most houses reporting a steadier demand and a larger volume of business.

Manufacturers of machinery who depend on the foundries for their castings continue to have considerable trouble in some cases in placing orders, as many foundries report that they are filled with business covering the next three months at least. Prices of both steel and iron castings have advanced as a result of the recent rise in the price of raw material and the foundries report that they have difficulty in getting all the skilled foundry labor they require. Some foundries will not make contracts covering deliveries for any more than the three months, and it is apparent that castings will cost during the next few weeks more than they have of late.

Extensive purchases of machine tools are being made by the International Steam Pump Company, New York, for its various plants, and it is understood that these purchases only cover a small portion of the machinery that will be required for carrying out the improvements planned. It is said in the trade that the company contemplates spending about $1,000,000 in building extensions to its plants and buying the equipment. On the return of President Benjamin Guggenheim from a tour of inspection of the company's plants it was stated that the plants were running at full capacity and that plans have been prepared for the extensions and for the purchase of new equipment on a large scale. It will be remembered that some months ago Mr. Guggenheim stated that the company contemplated largely increasing its capacity and taking up the manufacture of additional lines of machinery. These plans are now being carried out, and it is likely that for some time machinery houses will receive substantial orders from the company for mechanical equipment.

The New Jersey Zinc Company, New York, is getting preliminary estimates on a fair sized list of machine tools which it will likely purchase in the near future. It is understood that the machinery is required for some improvements the company has under contemplation at one of its plants and if it finally decided to make the improvements the tools on the list will be bought.

The General Electric Company is buying considerable more machinery for its plant at Schenectady, N. Y., which has recently been enlarged by the erection of several substantial new buildings. This company has been almost continuously in the market for the past few months and the aggregate of machinery purchased will reach a large sum. No extensive lists were issued, but inquiries for a few machines have been received in the trade every week or so.

Ground has been broken for the new machine shops to be erected at Tyler, Texas, by the St. Louis Southwestern Railroad. The new buildings, with the equipment, will cost between $250,000 and $300,000, and it is expected that the improvements will be completed by spring.

The section of the plant of Kraeuter & Co., Inc., 571 Eighteenth avenue, Newark, N. J., which was recently destroyed by fire, is to be rebuilt immediately. The company has placed a contract for the new reinforced concrete drop forging shop, which is to be 40 x 125 ft., and the machine shop will be rebuilt as heretofore. The company awarded contract some time ago for a new four-story reinforced concrete building, 34 x 135 ft.

The Reading Iron Company, Reading, Pa., is preparing for the erection of a large addition to its plant and arrangements are now being made with the city authorities to close four streets in order to allow for the proposed extension, plans for which have not yet been completed.

An enlargement of its plant is being planned by the Means & Fulton Iron Works Company, North Birmingham, Ala., which will be in the market this winter for some heavy machinery.

The Board of Estimate, New York, has approved the contracts for the construction of the first six sections of the Fourth avenue subway in Brooklyn and has appropriated $2,850,000 for the work. It will be remembered that contracts for this subway were let some time ago and that work has been held up on account of the question as to the debt limit of the city. The Public Service Commission has in its possession checks from the successful bidders for the work and notice has been given to the bidders to execute their contracts. The successful bidders for the work are as follows: For the first section, from the Brooklyn approach from the Manhattan Bridge to Willoughby street, James F. Graham, New York; second and third sections, from Willoughby street to Ashland place and from Ashland place to Sackett street, William Bradley, New York; fourth and sixth sections, from Sackett street to Tenth street and from Twenty-seventh street to Forty-third street, F. S. Smith Contracting Company, Philadelphia, Pa., and for the fifth section, from Tenth street to Twenty-seventh street, the Tidewater Building Company and Thomas L. Bryson, New York. The four-track subway which it is proposed to build from the Manhattan Bridge to Forty-third street in Manhattan will be divided into four separate tubes in order that the air will be kept pure by suction of the trains going through.

The Board of Water Supply, New York, has awarded contract to the Rinehart & Dennis Company, Washington, D. C., for construction of portions of the Croton and Kensico divisions of the Catskill aqueduct, at its bid of $4,545,487.50. The board has also awarded contract to the Ogden Iron & Steel Company, New York, for four 48-in. controlling valves, with operating mechanism, &c., for the lower gate chamber of the Ashokan reservoir, near Brown's Station, Olive, Ulster County, N. Y., at its bid of $54,900.

The American Car & Foundry Company will add to its Detroit plant at Ferry avenue and Riopelle street and the Grand Trunk and Lake Shore & Michigan Southern railroads, a one-story building, 60 x 1000 ft., of brick and reinforced concrete, with composition roof and metal skylights.

Business Changes.

The Gisholt Machine Company, Madison, Wis., manufacturer of turret lathes, boring mills, tool grinders, &c., has opened a New York office in room 1253, Fulton Building, 50 Church street. Ellis F. Muther, who is in charge, will look after the Gisholt interests in the Eastern States. The New York agency arrangement formerly in effect has been discontinued, the idea being to give to the business the closest attention of Gisholt specialists.

The Ridgway Dynamo & Engine Company, Ridgway, Pa., has opened a district office at 401-2 Woodward Building, Birmingham, Ala., under the management of F. M. Briggs, formerly with the Hardie & Tynes Mfg. Company, Birmingham.

New England Machinery Market.

BOSTON, MASS., November 2, 1909.

The totals for October show that business is increasing with the dealers rather faster than they had anticipated from the impressions made by every day results. Orders are coming from a greater variety of industries; the automobile trade and manufacturers of automobile parts and accessories are not so important a factor relatively speaking as they were. Heavy machinery is moving much better. The demand for planers especially shows a marked increase. The machinery builders are increasing their forces as rapidly as possible. Foundries are busy, though in a few cases they report a slight letting up as compared with the rush of business which had come to them. The metal industry outside of machinery, in other words the trades that use machine tools, continues to approach the maximum of production, which in very many individual cases has been reached.

The New England railroads are waking to the immediate necessity of increased rolling stock and to the fact that their repair shops have limitations which must be remedied, if the lines are to handle the traffic which is promised for the next year and more. The New York, New Haven & Hartford is using 98 per cent. of its freight equipment. The New York Central places the percentage at 94. In both cases the idle equipment consists of cars and locomotives in repair shops, where work is being rushed at maximum tension. The Boston & Maine is in the same condition. The New Haven road is issuing new securities, and large purchases of

equipment will be made, according to the general understanding. The New York Central, which operates the very important Boston & Albany system, announces the expenditure of $25,000,000 for locomotives and cars. New England looks for its share of the repair shop extensions and new works with which to take care of this greatly increased rolling stock of cars and locomotives. The announcement by the New Haven company of its plans for the new shops at the western end of its system, which will at least equal the great works at Readville, Mass., is looked for at any time now, though probably no definite reason for this expectation exists, beyond the fact that such a project has been seriously contemplated for a long time and the need for the shops is known to exist.

Advices from the Naugatuck Valley are that the brass industry has returned to a full normal basis, with some works and parts of other works running overtime. The mills are busy, and the factories which convert the metal into all sorts and kinds of goods are receiving orders in most satisfactory volume and are running at full production. Orders are coming in from all parts of the country and from abroad in increasing totals. The machinery builders who cater to the brass business are experiencing a corresponding revival in their trade.

It is reported in New London, Conn., that the site of the great shipbuilding plant at Groton, formerly occupied by the Eastern Shipbuilding Company, has been purchased by representatives of the Scott Shipbuilding Company of Scotland. The report is still unconfirmed, however. It is stated that a proviso of the sale is that the new owners shall build and maintain a dry dock large enough to take any ship of the present owner, the New York, New Haven & Hartford Railroad. The plant has been idle for some years, during which time report has sold it to various owners with large plans for its development. It is suggested that the sale may have something to do with the new tariff on material to be used in building vessels for the ocean-carrying trade.

The wages demanded by mechanics has come to be a serious matter with the machine shops. Men of little experience or skill are asking $3 a day, and many of the better men are going correspondingly higher in their demands. Where there are labor bureaus they serve a very useful purpose in this connection, as their records give to the employers exact data as to what workmen have received in former places. There is a better spirit than ever before between employers as to hiring men one from the other. Members of the Metal Trades Association all over New England are co-operating, each being careful not to induce men from the works of others. Some workmen when seeking employment have no scruples about misrepresenting where they come from, and in such cases there is always the chance that an employer will unknowingly get men from the shops within the association. But when the truth comes to light the inclination is to correct the condition. There is, of course, a constant effort on the part of some employers to get help at all costs, but on the whole the change for the better is a marked one. Employers realize that no element plays a more important part in raising the average cost of labor than the efforts of manufacturers to get one another's men. Wages must naturally advance with the scarcity of men, but the introduction of an artificial condition serves to accentuate the raise.

New England is becoming more eagerly interested in the meaning of the proposed change of freight schedules to the Pacific Coast, and though action is by no means concerted, the effort is making to prevent so radical a departure from existing customs on the part of the railroads and the Interstate Commerce Commission. Briefly speaking, the new rule would put into effect local rates between Eastern points and Chicago on all through shipments to the Far West. This would, of course, greatly advance freight costs as distances east from Chicago increase, and New England being at the extreme distance would suffer most of all. At present there is little difference in the rate from New England to the Pacific and that from points farther west but east of Chicago. It is feared that this additional handicap would have a serious effect upon the sale of Eastern machinery at the important Pacific Coast centers.

The J. A. Gowdey Reed & Harnes Mfg. Company, 40 Clifford street, Providence, R. I., manufacturer of textile machinery, is building a new factory at 1226 North Main street. It will be of brick, 45 x 79 ft., and two stories. The company states that it does not yet know what new equipment will be required immediately, but does not anticipate purchasing any great amount of machinery. The business is an old one.

The Union Packing & Refrigerating Company, a new concern, will establish a large refrigerating and packing plant at Montvale, Woburn, Mass., where it has purchased the property of Baeder, Adamson & Co., operated as a glue factory. There are modern buildings and machinery on the premises. New buildings will be of concrete construction. It is given out that the company has engaged the services of P. A. Kley, Philadelphia, as chief engineer, with M. J. Palsen in charge of the cold storage and refrigeration, and George P. Carver as consulting architect. It is proposed to operate an independent business on a large scale.

The Connecticut River Transmission Company, which markets the electric power of the Connecticut River Power Company, has accepted the franchise granted by the city of Worcester, Mass., and modified and approved by the Gas and Electric Light Commission. The franchise is similar to that given by Fitchburg, Mass., and limits customers to users of not less than 300 hp.

Hartford, Conn., is experiencing a large amount of industrial expansion in the way of manufacturing buildings. The Pratt & Whitney Company is to erect a pattern and general storage building, 60 x 150 ft., five stories, of reinforced concrete, made as nearly fireproof as possible. The Billings & Spencer Company, drop forgings, drop forging machinery and small tools, is contemplating extending its shipping room. The building formerly occupied by the Hartford Woven Wire Mattress Company, now having a number of manufacturing concerns as tenants, will be enlarged. The Universal Machine Screw Company, screw machines and screw machine products, and the Sachs Company, electric specialties, will erect new shops. The Hartford Machine Screw Company will make important enlargements. It is understood that other announcements of new shops and factories will be made before the new year.

Arthur W. Beaman, manager of the Stockbridge Machine Company, Worcester, Mass., was seriously, though not dangerously, injured in an automobile accident October 31. He sustained a fracture of the thigh and of the wrist.

It is given out at Bridgeport, Conn., that the plant of the Bridgeport Forge Company, recently seriously damaged by fire, will be rebuilt immediately.

New England has had a number of fires during the past fortnight, after a period singularly devoid of loss from this source. The boiler works of the William Allen Sons Company, Worcester, were damaged to the extent of $8000 October 27. The Warren Leather Goods Company, Worcester, sustained a loss of $10,000. The split leather factory of Blank Bros., Winchester, Mass., was damaged to the amount of $30,000.

The Bryant Box Company, Westfield, Mass., will erect a shop of its own, to be 40 x 100 ft., and four stories.

Enlargements and new works to be devoted to manufacturing outside of metal lines include the following: Baker-Vawter Company, Holyoke, Mass., new factory, 70 x 325 ft., three and four stories; Providence Dyeing, Bleaching & Calendering Company, Providence, R. I., additions to mills; William Pinkham Company, Burrillville, R. I., new plant to cost $40,000, to be occupied by the Royal Worsted Company and the Glen Worsted Company; North Lubec Mfg. & Canning Company, two-story factory building, at Rockland, Maine, to be 100 x 200 ft.; Springfield Knitting Company, Springfield, Mass., large addition; American Woolen Company, Boston, mills at Winooski, Vt., to cost $300,000. It is given out at Springfield, Mass., that the Samuel Courtould Company, Nottingham, England, silk and woolen goods, is looking for a site for an American mill, which will be 500 x 700 ft., and will employ 3000 people.

The Palace Auto Station, Inc., Worcester, Mass., is making inquiries for the pumps, turntables and other equipment which will be installed in a fireproof garage, which will be 80 x 142 ft., two stories.

The Stanley Rule & Level Company, New Britain, Conn., will erect a building, 60 x 100 ft., with el 60 x 80 ft., six stories and basement, which will give approximately 75,000 sq. ft. of floor space. It will be used entirely as a merchandising building, given up to packing rooms, shipping rooms, finished goods, stock, &c.

The Electric Light & Power Company, Greenfield, Mass., is arranging to make additions to its power plant. A steam turbine installation amounting to about 1000 kw. is planned to take the place of some existing equipment that has become worn out. The company has been making some additions to its coal conveying machinery.

The Bath Grinder Company, Fitchburg, Mass., has increased its capital stock from $20,000 to $100,000, paid in capital, with the same management as before. John Bath is president; A. L. Goodnow, vice-president; Robt. D. Gould, secretary and treasurer. The company hires the whole building it now occupies and is doubling its capacity and putting in additional machinery as fast as it can be secured.

Cincinnati Machinery Market.

CINCINNATI, OHIO, November 2, 1909.

The month of October produced about the September aggregate in local machine tool lines and the sales sheets will show the upright drills, lathes and milling machines as leaders. In these lines deliveries continue to grow more remote, so that in some cases machines cannot be promised earlier than May or June. It is the same story of a lack of experienced help, brought about largely through the encroachments of the automobile manufacturers. The question of prices is also a disturbing factor, and the situation is emphasized

by the attitude of the foundryman, who views with apparent alarm the rapidly increasing price of pig iron and his difficulty to get coke without paying prohibitive prices.

The lathe men have taken the initiative in trying to work out some plan to solve the problem, which came up at the meeting in New York City of the National Machine Tool Builders' Association, and the meeting last week at Buffalo was the first step. None of the lathe makers in this, the Western district, headed by President R. K. Le Blond of the R. K. Le Blond Machine Tool Company as committee chairman, will talk, but it is understood that a second conference will be called in a few days for a date in December, and in New York City, where the matter will probably be thrashed out and some definite plan of action agreed upon.

Under the plan which largely prevails here among tool builders, castings are purchased on the sliding scale basis, the castings mounting upward in cost as the price of pig iron advances; but now some foundrymen are urging for the assessment of an additional cost, 10 or 15 per cent. advance on this cost, to take care of increased costs of coke, labor, &c.

Nearly all tool manufacturers note a better inquiry from Europe, although trade from there cannot be said to have fully opened. Some recent shipments of shapers, lathes and drills have been to Holland, France and England.

Sales by dealers have been mainly of miscellaneous character, although lines of standard tools represented by the larger manufacturers have been especially active. There have been some good sales of planers and a few radials of the more modern types have been shipped to domestic points. A number of new special tools upon which local builders have been working for some time are about ready for the markets.

Arrangements are about completed for the quarterly dinner meeting of the Cincinnati branch, National Metal Trades' Association. The date is December 9, and the affair will, as usual, be given at the Business Men's Club. On the list of speakers will be Charles E. Carpenter, general manager of the E. F. Houghton Company, Philadelphia, oils and leathers for the industries; Dr. Wm. H. Tolman of New York, an illustrated lecture on accident prevention, and Edwin E. Bartlett of Boston, president Boston branch, National Metal Trades' Association.

This is expected to be one of the most interesting of the series of important meetings held by the Cincinnati branch. It is quite certain that some extremely important matters now agitating the tool manufacturers of the Central West will be up for discussion. The question of prices is agitating all local manufacturers of machine tools, and that will undoubtedly be a leading topic. Another very important subject to receive attention is that of freights. The efforts of railroads to increase freights, which are being strenuously opposed by the various receivers' and shippers' associations, will be discussed. The inconsistency of the railroad companies' agitation of the freight increase question, recalling the formation in New York City in January, 1909, of the Railway Business Association, is held by Metal Trades' Association members to be plainly apparent. Large local shippers of machinery contend that if the basic principles of the new railroad organization are observed and upheld there is no justification of the threatened raise in rates. The result of the meeting called in New York City by President Post of the association for November 10 at the Waldorf-Astoria will be watched with the greatest interest by our manufacturers.

Another matter that will doubtless receive some attention at the meeting will be the recently successfully inaugurated continuation school, in which the workmen are given needed education in other branches through the indulgence of their employers in the tool and machine shops. There are now about 223 students enrolled in the school, which is under the general supervision and patronage of the city school system, with J. Howard Ranshaw as teacher, at Twelfth and Jackson streets. It is now apparent that another teacher will soon have to be employed. Boards of education in other cities and States are deeply interested and the correspondence on the subject is very heavy.

C. R. Jenne of the Jenne Acetylene Gas Machine Company, Indianapolis, with a plant at Fort Wayne, Ind., is reported to be seeking a location where a new and larger establishment is to be built. Mr. Jenne is the inventor of the machine.

A proposition was recently made through promoters to the Commercial Club of Kenton, Ohio, for the removal to that city of a factory making safety fender appliances for street cars. The company desires to move to a smaller place, to get more working room and reduce rentals.

Citizens of New Concord, Ohio, are agitating the removal from Loudonville to that place of the Richland Handle Company.

Sandusky, Ohio, has an organization of business men and manufacturers which is committed to bring to that place a number of new industries. It is headed by J. J. Dauch of the Hinde & Dauch Company. A fund is being raised with which to start the work.

Late conferences between the representatives of the city and the owners of the American Rolling Mill Company at Middletown, Ohio, indicate that the new mill of that corporation is likely to be built in that city. The City Council, after learning just what the company would require, adopted a resolution covering all the points involved, even to the vacating of any and all streets necessary to the proper construction of the new plant.

Greaves Klusman & Co., Cincinnati, report October the best month of the year for that concern, which manufactures engine lathes, pattern makers and woodworking machinery, specialties, &c.

The Sebastian Lathe Company, Covington, Ky., is working full capacity and full time on medium-sized lathes.

The local shaper manufacturers report business from 80 to 85 per cent. normal and increasing, with an added interest in the larger anad more expensive types of back gear construction. Some important improvements in the geared types are under way by local manufacturers.

The I. Rheinstrom Engineering Company, Cincinnati, has increased its capital stock from $10,000 to $250,000. The added capital is to take care of enlargements of the factory and business, which is the making of bottle and bottle filling machinery. Later it is expected to put in some additional machinery. The company also has a good sized plant at Ludlow, Ky.

Chicago Machinery Market.

CHICAGO, ILL., November 2, 1909.

Trade in machinery lines is keeping well abreast of industrial developments in the Middle West, where in nearly all branches it is moving with satisfactory regularity and in volume of gratifying proportions. As observed in weekly periods there is, of course, more or less fluctuation in the general aggregate of business, but the average throughout holds up to the current level and in machine tools it is gradually rising. Fewer orders are coming from the leading builders of automobiles, a defection that would seriously affect the machine tool trade were it not that the demand has for some time past been growing more diversified. And, moreover, the influence of automobile construction upon the machine tool market is by no means confined to factories engaged exclusively in this work, but extends to a large and growing field occupied by the manufacturers of car accessories and parts. Encouragement is lent to the creation of such industries in different sections of the country by the extraordinary pressure upon auto-car plants, making it expedient for them to place liberal outside contracts with such concerns. It is needless to say that machine tool houses and manufacturers are watching the trend of affairs in this industry with a good deal of interest, since it has become a channel of extreme importance for the distribution of their product. The general impression is that while business from this source may be comparatively light for the remaining months of the year, further purchases of considerable magnitude will be necessary to provide adequate facilities for turning out enough cars to meet 1910 contract obligations. It is thought also that a good many buyers are withholding orders that might otherwise be placed now uitil after the automobile shows, which will begin in New York early in January and will be held in Chicago February 5 to 12, inclusive. These annual exhibitions have come to be events of importance to machinery dealers and will be largely attended by representatives of the machine tool trade. Excellent opportunities are afforded buyers on these occasions to test, observe and compare the merits of tools displayed and demonstrated.

George W. Jackson, Inc., Chicago, has purchased a tract of land adjoining the site of its present structural steel and bridge shops at Ellston avenue and Chicago River for the purpose of enlarging the works. It is estimated that improvements planned will cost about $2,000,000, including buildings and the equipment. When completed the works will have capacity for turning out 6000 tons of fabricated steel a month and will cover about 7 acres of ground, 45 x 240 ft. of which will be used by the office building and pattern shop, which are already under construction. Work will be started immediately upon the main building, 150 x 570 ft., with the expectation of having it completed by the middle of next year. Arrangements have been made for some of the machinery required to equip the new buildings, but a considerable portion of it is yet to be purchased.

The Indiana Motor & Mfg. Company, Indianapolis, Ind., will receive bids for motors and a full line of electrical equipment to be installed in a factory building in Franklin, Ind.

The Detroit Valve & Fitting Company, Detroit, Mich., is completing preparations for the erection of a plant at Wyandotte, Mich., for the manufacture of brass, malleable and cast iron fittings, to cost about $50,000. It is stated that a like amount will also be expended for machinery.

The Venn-Severin Machine Company, Chicago, Ill., has been incorporated with a capital stock of $25,000 to manufacture an oil engine and miscellaneous machinery. The

company is building a plant, 50 x 70 ft., which is now nearly completed and is expected to be running by December 1. All the machinery required for the equipment of this plant has been purchased, but it is the intention of the company to add a 50-ft. addition later on for which new equipment will be required.

Sealed proposals in triplicate for furnishing and installing two outside center packed duplex pumps in pump house at Fort McIntosh, Texas, will be received until November 15, 1909. Proposals should be addressed to Col. John L. Clem, C. Q. M., San Antonio, Texas.

The D. O. James Mfg. Company, Chicago, manufacturer of planed and cut gears and the O. K. speed reducer, has completed the installation of new machinery that will give it additional capacity and enable the company to take care of its rapidly increasing business.

Eastman & Johnstone Mfg. Company, Dallas, Texas, manufacturer of ornamental staff work, has under consideration the erection of a building, 50 x 50 ft., two stories and basement, which will be equipped with elevator, dryrooms, carriers for handling material, &c. The machinery requirements will consist of combination saws, band saws, motors, &c. The cost of the building when completed will be about $15,000.

B. E. Dwinnell & Co., Amherst, Wis., are making preparations for the enlargement of their hydro-electric plant, which include the construction of a concrete flume and the installation of new turbines, electrical machinery, &c.

The latest improvement in connection with the plant of the Gas Tractor Company, Minneapolis, Minn., is a testing room in which the company will be able to test from 6 to 12 motors at a time. The plant, which at present contains 35,000 sq. ft. of working floor space, will probably be enlarged in the spring by the erection of an addition to the machine shop and warehouse. The company advises that it is not in the market for any equipment at the present time.

Milwaukee Machinery Market.

MILWAUKEE, WIS., November 2, 1909.

The machine tool situation continues to improve, and whereas orders have heretofore been mainly for apparatus of general utility, such as milling machines, shapers, grinders, drills, &c., buyers of turret lathes, boring mills, planers and heavy hydraulic pressure machinery are now coming into the market quite freely. It will probably have been noted by those who have read this report that extensions and shop additions made in this State during the past six months have been almost entirely for the account of manufacturers of tools of the class first mentioned; but builders of the heavier equipment now feel the force of the renewed demand sufficiently to compel them to plan for increased capacity, and the writer is in a position to know that some interesting announcements may be made within the next 10 or 12 weeks.

Trade with Europe, South America, Japan and even Australasia has been opening up in good shape, and good prices, basis f.o.b. factory or seaboard, are now being realized. Difficulties in relation to the honoring of drafts for advance payments, which prevented the completion of not a few contracts taken about a year ago, have entirely disappeared, and relations with foreign customers generally seem to be very cordial at this time.

An indication of present industrial tendencies which have been prominent here of late is the continued purchasing of heavy industrial machinery and apparatus of all kinds designed for the most severe character of service. A leading builder of large traveling cranes, whose shop extensions are referred to below, has orders booked for more than 100 cranes of large capacity, and inquiries are increasing weekly. This in itself indicates the impending construction of new plants where heavy material will be worked upon or handled, and it is accompanied by confirmatory reports from large machinery builders in all lines established in this section.

How one requirement brings on another is shown by the fact that in many of the Western smelters charges handled have increased so much in size, with corresponding enlargement of the apparatus used directly in each process, that the cranes originally installed are now insufficient to care with safety for the loads put on them, the blowers are too limited in strength to render satisfactory service, the power plants need constant nursing in order to meet the demands made upon them, and the auxiliary equipment of all kinds has become outdated by recent progress. Hence buying from this source is now very general and it will tend to increase from one month to another as resumption of activity becomes more pronounced.

Mining engineers who have recently returned from trips through the principal producing section of Mexico, Arizona, the mountain States and British Columbia, are practically unanimous in reporting great activity all along the line, and this is confirmed by correspondence in the files of local machinery men. In many cases, however, actual purchases are awaiting the consummation of negotiations for additional funds which are now being carried on between the mining and milling operators and capitalists of the Eastern and Central States. Foreign investors also have experts investigating various properties and, as often as these are satisfied, money for new machinery will be forthcoming. The situation is, therefore, one of great promise for the future.

Frederick B. Warren, Green Bay, Wis., has organized a company for the manufacture of boilers, radiators, &c., and work on a plant is already in progress. The bulk of the initial equipment has been ordered, but more will be purchased after January 1.

The Cream City Foundry Company, Milwaukee, has been incorporated with a capital stock of $20,000 by Joseph Foertsch and others.

Machine tool equipment, including planers and lathes, is needed for the Kearney & Trecker Company's new shop, at West Allis, Wis., but some purchases have already been made.

The F. J. Greene Engineering Works, engine builder, at Racine, Wis., is reported to have begun work on an addition which will double the capacity of the plant.

Pawling & Harnischfeger have decided upon the erection of a new shop, 60 x 200 ft. For details of equipment address inquiries directly to them. It is reported that boring mills, lathes, planers and grinders have been already contracted for.

The Beaver Dam Malleable Iron Company, Beaver Dam, Wis., is putting its plant in shape for a season of heavy business, such as present orders indicate. Some new machinery will probably be needed before long.

Clarence Slayton, Oshkosh, Wis., is interested in the erection of a new shop, 60 x 120 ft., for tool work on power boats. Some light machinery will be required.

The Milwaukee Corrugating Company has secured from the United States Circuit Court of Appeals a decision sustaining its right to the exclusive manufacture of a patented sheet metal elbow made by a special process.

W. J. Roseberry, until this time engineer for the Chain Belt Company, has formed, with R. J. and Henry E. Schwab, the Milwaukee Concrete Mixer & Machinery Company. The foundry and a part of the Schwab furnace plant will be occupied by the new company. Mr. Roseberry brings to this business a large experience, having helped to put nearly all of the present standard mixers on the market.

Whitney Bros. are installing machinery for a cement brick plant at Superior, Wis., and additional equipment is to be secured later.

A central heating plant, with large boiler capacity, is under consideration by the municipal authorities, and steps have been taken to secure a suitable site.

Contract for the new water works at Park Falls, Wis., recently mentioned in this report, has been let to Greene Bros., Albert Lea, Minn., but this does not include the pumping machinery.

The plant of the Burlington (Wis.) Brass Works will be largely extended and new equipment purchased.

The Cleveland Cliffs Iron Company has completed plans for the new hydraulic power plant to be built not far from Negaunee, Mich., and local machinery builders will bid on the work.

The plants of the Wisconsin Box Company, Wausau, Wis., and Lake Superior Lumber & Box Company, Ashland, Wis., which were destroyed by fire, will be rebuilt for increased capacity, necessitating the purchase of a large quantity of power and woodworking machinery.

Madison, Wis., will have a new motor-operated pumping plant, the plans for which were recently approved.

The A. O. Smith Company, Milwaukee, has ordered a line of heavy punch presses for its new works.

Some additions will probably be made in the spring to the buildings and equipment of the New Doty Mfg. Company, Janesville, Wis.

Lutter & Gies, Milwaukee, are in need of enlarged quarters, and it is reported, although without direct confirmation, that they will build shops at West Allis a little later on.

A new power plant for the State buildings at Oshkosh, Wis., has been decided upon by the authorities at Madison.

An engineer returned from Hibbing, Minn., reports that the Oliver Iron Mining Company is opening up two new iron mines there.

Additional machinery will be purchased by the Green Bay Paper & Fiber Company, Green Bay, Wis., which has decided upon an extension of its mill.

Wolfinger Bros. will require power equipment and some special canning machinery for a factory to be built at Eland, Wis.

J. R. Kommer, Milwaukee, has been engaged by the city of Wheeling, W. Va., as designing and construction engineer for the new pumping plant and water system.

Three Gates breakers, with elevators, screens, &c., for a complete limestone crushing plant, the product of which goes largely to steel mills, has been installed by the Allis-Chalmers Company of this city for the Ohio & Indiana Stone Company, Greencastle, Ind.

There is notable activity in the construction of pumping plants and water supply systems, for both municipalities and mines, on the Upper Peninsula and along the iron ranges in Minnesota. Among the more important projects now under consideration are new water works for Marquette, Mich., where a high duty pumping engine will be installed in the near future, although no definite plans have been yet approved.

The D. J. Murray Mfg. Company, Wausau, Wis., which is extending its saw mill machinery plant, will build an addition to the pattern and molding departments next spring. A number of molding machines are likely to be bought.

In a letter received by a Milwaukee firm from its traveling agent in Michigan, the statement is made that the St. Joseph works of the American Tool Company, which burned last week, will be rebuilt at once by the St. Joseph Improvement Association, from which they are leased.

The new plant of the Badger Motor Car Company, Columbus, Wis., is nearly completed, but, as the entire annual output for which it was designed has been sold for 1910, it will be necessary to start work shortly on an addition. This company will be in the market for considerable machinery as its business expands.

A steel bridge 600 ft. long will be built across the Escanaba River, after January 1, by the Escanaba Traction Company, Escanaba, Mich.

A mechanical filtration plant has been authorized for construction by the city of South Milwaukee, a municipality separate from Milwaukee, and the contract will probably be awarded to the American Water Softener Company, Philadelphia, Pa.

The American Oxhydric Company's new apparatus for cutting steel was given its first public test in connection with an explosion of four water tube boilers in the power plant of the Pabst Brewing Company, Milwaukee. The wreckage was piled high, with the metal plates, rods and structural beams so entangled that the mass had to be cut away a section at a time. By means of the new process, which proved a complete success, this was very quickly done; oxygen and hydrogen, that combined to cause the cutting flame, being supplied from two portable tanks.

Cleveland Machinery Market.

CLEVELAND, OHIO, November 2, 1909.

General conditions in the local machinery market continue very satisfactory. Merchants report the receipt of a good volume of small orders during the past week, nearly all for small or medium sized tools. No large inquiries have come out, however. Taking the month as a whole, the aggregate amount of business done in October was about the same as during September. The buying has become very general, and while the most of the orders are coming from small shops, a fair volume of business is coming from large manufacturing establishments that are adding some new equipment. An improvement is noted in the demand for tools for new shops. Quite a number of new concerns in metal working lines are springing up, but they are usually not large and their machinery purchases are limited to a few small tools. Sales to the automobile trade are now light, although some orders for one or two tools are still coming from that source. The automobile plants in the Central West are generally running at full capacity in the manufacture of their 1910 output, and with the probability that the capacities of the plants will be taxed during the next few months a good volume of small orders from this source is looked for during the winter. Orders from railroads are somewhat more plentiful, but the demand from this source is not yet active. Owing to delayed deliveries on several lines of tools, the demand for second-hand tools has become very active, but the supply does not equal the demand. Buyers want quick shipment, and when they are unable to secure early delivery on new tools they make inquiries for second-hand ones.

While some of the local tool builders, particularly makers of drilling machines and automatic machinery, are well sold up for the balance of the year and longer, other local plants in machinery lines are not as yet running to their maximum capacity, although they have a good volume of orders on hand. In heavy handling machinery, inquiries are more plentiful and the outlook is very satisfactory. The demand for locomotive cranes shows a decided improvement, orders now being fairly plentiful. The demand for cars and locomotives for industrial railroads is gradually improving and better prices are being obtained.

In the foundry trade makers of both light and heavy gray castings are well filled with work.

The Lees-Bradner Company, Cleveland, has been incorporated with a capitalization of $25,000 by Ernest J. Lees, H. T. Bradner, Frank B. Williams, C. C. Wise and I. B. Graham, to manufacture a new gear hobber recently invented by E. J. Lees. The company has established a plant at 1967 East Fifty-fifth street, in a building formerly occupied by the Lambert Machine Company. Later the company expects to install additional equipment. The company reports the receipt of a very satisfactory number of orders and has all the work it can do with its present capacity.

The United Electric Company, Canton, Ohio, which is backed by the interests connected with the Berger Mfg. Company, has been incorporated with a capitalization of $200,000 to take over the plant of the Power Electric Company of that city. The latter company has been manufacturing electrical specialties, with a plant on Hurford street. Large additions to the plant will be erected and considerable new machinery will be installed. The officers of the new company are: E. A. Langenbach, president; Harry R. Jones, vice-president; W. W. Irwin, secretary, and Charles L. Goughnour, treasurer and general manager.

The Atlas Car & Mfg. Company, Cleveland, reports that the demand for industrial cars continues to improve. The company now has a large amount of work on hand and inquiries are quite plentiful. During the past few days this company has taken the following orders: A 20-ton standard gauge electric locomotive; a number of charging, billet and electric cars for a steel plant; four orders for mining cars, one from South America for 40 cars, and three from Mexico aggregating 60 cars.

The Buckeye Machine Die & Tool Company, Cleveland, has been incorporated with a capitalization of $10,000 by Julius A. Horn, John Horn and others. The company has established a plant at 2617 East Seventy-sixth street for the manufacture of all kinds of dies and special machinery. The plant is 48 x 110 ft. The officers of the company are: Laddimir Patek, president, and John Horn, secretary and treasurer.

The Foote-Burt Company, Cleveland, maker of drilling machines, reports more orders on its books than at any previous time in the history of the company. The company is not promising deliveries on the most of its lines until next March, being nearly all sold up until that time.

George J. Warden & Co., carriage manufacturers, have commenced the erection of a new factory building on Carnegie avenue, to replace their plant which was recently destroyed by fire. The National Iron & Wire Company has the contract for the structural steel work. Warden & Co. expect to be in the market soon for a number of small motors for individual drives for their machinery equipment.

George D. Wick of Youngstown, Ohio, states that there is no truth in the published report that the plant of the Garry Iron & Steel Company, Cleveland, of which he is the head, will be removed from Cleveland to Youngstown.

The Welton Automatic Fender Company, Columbus, Ohio, has been incorporated with a capitalization of $20,000 to manufacture a new fender for street cars. The incorporators are D. J. Welton, George C. Welton, J. W. Howe, H. H. Ebright and S. W. Gilliland.

The Auto Cycle Company, Salem, Ohio, has been incorporated with a capitalization of $100,000 by H. M. Silver, A. O. Silver, E. W. Silver, H. C. Grouchild and R. W. Campbell.

Philadelphia Machinery Market.

PHILADELPHIA, PA., November 2, 1909.

The month just closed can hardly be termed an active one as far as the volume of business transacted by machine tool merchants in this territory is concerned. Buying has been rather irregular, and by far the larger proportion of the orders taken have been single tool propositions. Manufacturers, in a number of instances, however, report a steady betterment in the volume of business. Few orders have been of large size, but there has been a more steady demand coming from many different sections of the country. General inquiries increased quite materially during the closing weeks of the month, not only for single tools for extensions or replacement, but quite a little business of a more extensive nature developed, which, however, has not reached the definite order stage. Under the circumstances the trade is much encouraged with the prospects for a more active fall business, and, with the increased activity to be noted on the part of the railroads which have purchased large numbers of cars and locomotives and still have heavy inquiries for this class of equipment under negotiation, looks forward to decidedly better conditions after the turn of the year. Many of the industrial plants are now rapidly approaching normal conditions, and with the demand steadily increasing, as it is now expected that it will, their requirements in the way of machinery equipment should naturally expand. Locomotive works are steadily increasing in point of activity, and the local company has, it is understood, considerable work under consideration for the improvement of its Eddystone, Pa., plant. Machine tool builders show more active conditions, and while not employing as many workmen as they did during former prosperous years, are steadily adding to their forces; full time is now being made at the majority of the

plants of the larger concerns, while some of the smaller shops, employed largely on special equipment, are working extra hours. The foreign demand has been irreguar throughout the month, comparatively little business coming to the trade in this territory as far as tools of the standard types are concerned. Some scattered orders for equipment of a special nature have been taken, while those manufacturers transacting an established trade abroad in various specialties report about an even volume of business.

The second-hand machinery market reflects pretty generally the same conditions to be noted in connection with the demand for new tools. Buying has been somewhat irregular, but, on the whole, shows a little betterment. Purchases have not been confined to any particular line or class of tools or equipment, buying being largely of a general character. Second-hand engines have been rather dull, although the demand for second-hand electrical equipment and moderate size boilers has been fair. A trifle more business has been taken by engine builders, particularly in medium horsepowers. Boilermakers are quite actively engaged.

The foundry trade shows greater activity. Orders are coming out more freely and are of better size. Steel casting plants are in some instances pretty well filled up with orders and deliveries are not so prompt. Heavy car and locomotive business has resulted in increased activity for a number of foundries. Gray iron founders, making a specialty of machine tool castings, report a better demand, while general jobbing foundries note improved conditions.

The Sanders Motor Car Company, Lancaster, Pa., manufacturer of the Sanders gasoline railroad motor cars, has been inquiring recently for a considerable quantity of machinery and tools, purchases of which will probably be made in the near future.

The Gandy Belting Company, Baltimore, Md., has awarded a contract to McLaughlin Brothers of that city for the erection of a four-story brick addition, 70 x 130 ft., to its present manufacturing plant.

The Department of Supplies, city of Philadelphia, Joseph H. Klemmer, director, will open bids November 15 for a quantity of supplies for use during the coming year, including, under class E, electric cable, wire, lamps, supplies, telephones and instruments; under class O, lubricating oils, grease, tallow, graphite, illuminating oils and boiler compounds; under class P, paints and general painting supplies. Specifications may be obtained at the office of the director, rooms 310-312, City Hall.

The American Pulley Company will erect a two-story factory building, 50 x 120 ft., at its plant at Twenty-ninth and Bristol streets. The new shop will be utilized for the manufacture of wrought steel pulleys in sizes larger than 48 in. in diameter, and will be equipped with such special machinery, which has already been purchased, as to enable it to make pulleys up to almost any reasonable size in diameter. This concern reports business steadily improving.

The Remington-Sherman Company, manufacturer of safes and vaults, has awarded contracts for the erection of two additions to its plant at Beach and Morse streets. These will serve as an addition to the machine and erecting shop, and measure 85 x 224 and 35 x 91 ft. on the ground plan; the former will be two stories. While additional equipment in the way of machinerey, &c., will be required, its nature has not yet been decided upon.

The Hess Machine Works is running its plant on full time and almost full handed. Business has been increasing steadily during the past few months and now reaches almost normal conditions. The demand for filemaking machinery has increased; two sets of machines have been recently shipped to customers in Germany, while two sets are being built for parties in England. The domestic demand for these machines is also increasing and orders have been taken for several sets for both Eastern and Western shipment. Considerable machinery of a special nature is also being built by this concern, among which is one of a special type for the manufacture of tooth picks.

The Iszard Warren Company, manufacturer of precision instruments, which has been located at 1122 Vine street, has moved its plant to 136 North Twelfth street, where the entire building will be occupied. The first floor will be used for showrooms and offices, the remaining three floors of the building being devoted to manufacturing purposes.

The Baldwin Locomotive Works has booked some heavy orders during the past week or two, including, among others, 50 engines for the Chicago, Milwaukee & St. Paul; 50 for the Erie Railroad; 20 for the Seaboard Air Line; 6 for the Atlanta, Birmingham & Atlantic, and 6 for the Kansas City Belt Railroad. The plant is now being operated at about 60 per cent. of its full capacity and is steadily increasing its working force, a total of 9500 now being employed. This company has just begun some extensive improvements to its Eddystone, Pa., plant. A new erecting shop of steel and terra cotta construction, about 200 x 400 ft., is to be built, which will constitute about one-fourth of the building ultimately planned for erecting purposes. An elaborate system of railroad tracks will be laid out connecting with the Pennsylvania, Philadelphia & Reading and Baltimore & Ohio railroads. The principal equipment for the new erecting shop will be electric traveling cranes, which have been already ordered.

Trade Publications.

Coal Dealers' and Contractors' Scales and Equipment.—The Standard Scale & Supply Company, Pittsburgh, Pa. Bulletin L-24. Scales ranging from a postal balance scale to large scales used in weighing loads of coal are shown, together with coal screens, chutes, shovels, canvas coal bags and similar supplies. Several types of gas and gasoline engines and a concrete mixer of the batch type are also illustrated, and prices of the company's standard lines are listed.

Circular Saws.—Hunter Saw & Machine Company, Fifty-seventh and Butler streets, Pittsburgh, Pa. Two booklets. Both of these treat of circular saws made from vanadium alloy steel which are adaptable for cutting hot ingots, cold shapes, castings, &c. One booklet describes the method of manufacture and gives an account of tests of a high speed hot saw made by the company which cut 65 hot ingots of 0.65 to 0.85 per cent. carbon steel into nine slabs each, without being reset. The other booklet lists standard saws made by the company and gives prices.

Special Metals.—Stark Rolling Mill Company, Canton, Ohio. Two booklets. One of these treats of Alumaloyd sheets, which are of a special steel coated with aluminum-alloyed metal designed especially for automobile bodies, fenders, hoods, &c. The method of manufacturing these sheets is explained and several parts of automobiles formed from the metal are shown. The second booklet is devoted to Toncan metal, an anti-corrosion, rust-resisting black or galvanized sheet brought out by the company for roofing, sidings, cornice and tank work, stacks, &c.

Lathes.—Lodge & Shipley Machine Tool Company, Cincinnati, Ohio. Catalogue T, 6 x 9 in., 16 pages. Describes the company's Marvel lathe, which is made in three sizes, 2 x 24 in., 2½ x 36 in. and 4 x 48 in., the figures indicating respectively the diameter and length of stock the lathe will admit. Sectional illustrations of the standard sizes are shown and the operation is fully described. The illustrations include a 4 x 48 in. lathe and 2½ x 36 in. lathe, together with various attachments used with the machines. An illustrated description of the Marvel lathe appeared in *The Iron Age* July 29, 1909.

Power Plant and Machine Shop Specialties.—Gem Mfg. Company, Pittsburgh, Pa. Booklet. A line of steel and brass oilers and tallow pots, railroad torches, flue scrapers, foundry chaplets, &c., is listed, together with a flexible shafting made by the company and a small portable electric plant for drilling, grinding and kindred work. A portable emery grinder, a center grinder and a breast drill are also shown and listed.

Fuel, Oil and Gas Burning Furnaces and Appliances.—W. S. Rockwell Company, 50 Church street, New York. Pamphlet. This is an advance pamphlet of a new catalogue being prepared by the company and contains illustrations of numerous furnaces and furnace appliances.

Suction Conveyors.—Darley Engineering Company, Singer Building, New York. Bulletin No. 4 and pamphlet. Pertains to a suction air pressure conveyor for removing ashes from power plants, &c. A feature of this conveyor is a water jet located in the conveyor pipe through which the material passes, with the aid of which it is cooled and dust is eliminated. This system has been mentioned in previous reviews of the company's literature, and the pamphlet which accompanies the bulletin contains numerous testimonials from satisfied users.

Elevating, Conveying and Power Transmitting Machinery.—W. H. Caldwell & Son Company, Western avenue and Seventeenth street, Chicago, Ill. Catalogue No. 34, 6 x 9 in., 147 pages, bound in cloth. A brief description of the company's large plant, together with illustrations of the principal buildings forms an introduction to this well arranged volume, after which the standard Caldwell Helicoid conveyor is described. Several types of conveyors made by the company are then taken up and illustrated with brief descriptive matter. Special machinery for flour mills, cottonseed oil mills, alfalfa plants, cement works, &c., are referred to, and some of them are shown, after which gears and fittings and general supplies covering the needs of machinists and founders are mentioned, together with tabulated price-lists. The book shows strikingly what a very varied line of equipment the company makes.

Color Mills and Mixers.—Charles Ross & Son Company, 148 Classon avenue, Brooklyn, N. Y. Circular No. 15. Shows a number of color mills and mixers and other machinery for the manufacture of drugs and chemicals.

Disk Grinders.—Gardner Machine Company, Beloit, Wis. Folder. Illustrates and describes the application of the company's disk grinding machines to special operations required in the manufacture of auto, marine and stationary gas engine parts. Photographs of such work as grinding intake manifolds, universal joints, pump cases, exhaust connections, jacket plates and cylinder covers are reproduced, showing just how the several operations are performed.

HARDWARE

IT appears after all that the action of the National Paint, Oil and Varnish Association in approving the establishment of a parcel post scheme does not possess much significance, and was not in any sense representative of the attitude of the trades indicated in the comprehensive title of the organization. This association by the way is made up of local Paint clubs, embracing all classes of people who have to do with Painting materials, from Brush manufacturers to Window Glass jobbers. Its action has been already repudiated by the Paint manufacturers of the country through their thoroughly representative organization. The circumstances, too, under which the resolution favoring a parcel post was adopted are also significant. It appears that the chairman of the Committee on Postal Laws and Regulations was unable, on account of illness, to prepare a report, but, as is officially stated with charming simplicity, the report was submitted by some one whose name is not disclosed, based "on data furnished by the secretary of the Postal Progress League," an estimable gentleman undoubtedly, but widely known as an advocate of the wildest and most impracticable schemes for the delivery of merchandise through the mails. The committee thus made itself the mouthpiece of those who favor the most radical form of parcel post legislation without the slightest suggestion that any attention was given to the considerations on the other side of the question. How it came to be adopted by the association is not explained. Many of the members of the association are certainly opposed to the project commended in the resolution, and we understand, indeed, that some of them did not even know that action had been taken on the subject.

Paint Manufacturers and Parcel Post

Whatever importance the attitude of the interests represented in the convention may possess, it is certain that the Paint manufacturers and jobbers are opposed to the establishment of a parcel post. Fortunately in this case only a week after the Philadelphia meeting, where the project was indorsed, the annual meeting of the Paint Manufacturers' Association of the United States was held. In this association practically all the Paint manufacturers of the country are represented. At that meeting the following preamble and resolution were unanimously adopted, condemning clearly and emphatically the proposed extension of the parcel post system:

Resolutions on Parcel Post

Whereas: We believe the interests of the community will be better served and their independence better preserved by a wide distribution of merchandise as now effected through local merchants scattered throughout the country than by a few large catalogue houses in the already congested trade centers, and

Whereas: A domestic parcel post, and especially H. R. Bill 10762, is in our opinion calculated to promote the business of the catalogue house, to the detriment of the local village merchant, and

Whereas: The service contemplated in said bill could be rendered only at great cost by a government department, which already suffers a large annual deficit; therefore, be it

RESOLVED: That the Paint Manufacturers' Association of the United States is opposed to any extension of the parcel post system, and particularly to the passage of H. R. Bill No. 10762, now before the National House of Representatives.

It may be that in connection with holiday trade some Hardware merchants might advantageously give attention to Toys, especially those which, as made of metal and possessing mechanical features, have a close kinship with regular Hardware. That it might be worth while to do something along this line is indicated in the extent of the trade and the broad margins of profit which are usually realized. The total production of Toys in this country in the past decade must have attained a value of at least $50,000,000, and, including imports, the Toys supplied to the people of the United States during the decade have aggregated at wholesale about $100,000,000. It is further doubtless true that no inconsiderable amount would be added to these figures if the value could be ascertained of the Toys made by novelty manufacturers as part of their lines, which were hardly discoverable by the census canvassers, who presumably classify as Toy-making establishments those only which make this line of product their specialty.

Toys as Holiday Goods

Condition of Trade.

The Hardware market during the past week has been without event of special significance, things continuing to move steadily, with a good volume of current business and hopeful anticipations in regard to the future. That there is much doing is indicated in the reports from the Steel mills, many of which are sold far ahead. Some manufacturers are in an analogous position, finding orders accumulating on their books and customers calling for prompt shipment. The transportation question is also beginning to assume something of its old significance as there are indications that the volume of traffic will overtax the facilities of the railroads, and even now, here and there, there is talk of delays, shortage of cars and similar consequences of a large movement of merchandise. Manufacturers in some cases are experiencing difficulty in getting raw material as promptly as they desire, but as yet this is not causing serious or general inconvenience. A marked feature of the situation is the provision made for this condition of things by the jobbing trade of the

country. As a rule the jobbers purchased freely and at the proper time to get the benefit of advances which have since occurred. While there is some cutting of prices on their part there is not more of this than is usual under existing conditions, but in some lines they are in a position to undersell the manufacturers and some irregularity in current prices is thus occasioned. It is a state of things in which there is opportunity for retail merchans to give careful attention to their buying, as by keeping in close touch with the market they will often be able to save 5 or perhaps 10 per cent. in the price of goods. At the same time the market has such a strength that a more liberal policy in the purchase of goods than has until recently been judicious is now justified, inasmuch as there is not much probability of a general weakening of values, and in a good many lines advanced prices are not unlikely. In this gratifying condition of things retail merchants, most of whom seem to be doing a good business, are evidently still pursuing a conservative course, a fact which constitutes one of the most favorable features of the business situation. If all classes in the trade should be governed by a sane and balanced enterprise it would promise well for the long continuance of prosperous commercial and financial conditions.

Chicago.

The growing congestion in the steel mills is creating difficulty for many of the manufacturers of Hardware who use steel as their raw material. The manufacturers of Bolts, for example, have had more or less difficulty in getting prompt deliveries from the steel mills, especially for the larger sizes of Bolts for which they use bars. Along with this difficulty they are embarrassed by the uncertainty regarding prices of Bars, Rods and Wire during the coming year. This does not affect them seriously in their relations with the Hardware jobbing trade, as contracts with jobbers are only made for 30 to 60 days' deliveries, and the manufacturers have not sold to this trade any considerable tonnage for delivery beyond January 1. A year ago the troubles of the Bolt men were along the line of efforts to maintain stability in prices, but now the problem is to turn out the product fast enough to satisfy the demands of all their customers. Bolt makers have two distinct fields of trade to cover, the merchants and the demand from manufacturers who use Bolts in enormous quantities in their finished product, such as, for example, the manufacturers of agricultural implements. These manufacturers usually buy their Bolts on yearly contracts running from July 1, and the Bolt men are under pressure already to name prices for delivery to July 1, 1911. In the present condition of the steel trade it is out of the question for the Bolt manufacturers to name any prices as the basis for contracts so far ahead. The best that the steel mills will do in making prices is for deliveries through the first half of 1910. The manufacturers of agricultural implements have demonstrated in many former doubtful periods their shrewdness in forecasting business conditions, and their willingness at this time to contract nearly two years into the future for important materials is very good evidence that the iron and steel industry and everything dependent upon it will enjoy a long period of prosperous business. The agricultural industries have been unusually prosperous during the past year, and the manufacturers in this field have had a record breaking volume of business the past summer; in fact, many of them who had contracted for their annual supply of Bolts to July 1 have already taken or specified their entire tonnage for the year, and they are now in the market for additional requirements. This enormous demand from the manufacturing consumers of Bolts has its logical effect on the other branch of the business, the Hardware trade. Fortunately the Hardware jobbers bought liberally last spring and accumulated large stocks when the price of raw material was low, and these stocks have served as a commercial reserve to carry them over the difficulty that has arisen recently in getting deliveries from the Bolt manufacturers. From now on the manufacturers will of necessity follow a policy, which will keep light stocks in the hands of jobbers, and this will promote stability in prices. The conditions that prevailed last year when the jobbers would often undersell the manufacturer with his own product in the open market will not be likely to recur for a long time in the future.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—We are now enjoying a season of beautiful autumn weather for which our climate is famous. It is affording the farmers a splendid opportunity to gather their corn and pick their cotton in good condition, thus adding something to the quality of the crops and incidentally to the already enormously high prices which these commodities are bringing on the market.

The recent high prices of cotton have stimulated the trade wonderfully and from the best information we are able to obtain the Hardware trade has resumed its normal proportions. Business in October with our company was a little heavier than it was in 1906 and about the same as that of 1907, at which time we thought we had reached the crest of the prosperity wave.

We are having considerable trouble in getting cars in which to ship Stoves and Hollow Ware and we are beginning to receive letters from manufacturers, who complain of car shortage. The Hardware market seems to be in good condition and slight advances are being noted on many lines. Collections are pretty good and, taking it altogether, we think the situation is quite satisfactory.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—October was a very satisfactory month, showing a heavy increase in sales as compared with last year. Business continued to gain in strength and volume as the month progressed. November opens with all departments working to full capacity and some departments working nights.

The current business (that is, orders for immediate shipment) has been running unusually strong in October. Our sales in September were swelled by the filling of future shipment orders for Cutlery, Sporting Goods, Stove Goods, &c. We carried very few of these shipments over into October. Neverthelss our October sales, composed almost entirely of current business, will show an increase over September.

This somewhat unusual condition indicates an expanding volume of retail business throughout our territory. The business this season is late. On account of the short cotton crop merchants in the cotton States were conservative in placing future orders. The high and increasing price of cotton is, in a large measure, making up for the short crop. It is evident stocks of goods, especially in the cotton growing States, are very low and now when the fall business strikes them these merchants find it necessary to make C. Q. D. calls for goods.

At the Atlantic City conventions the manufacturers were almost unanimous in reporting a strong demand for goods; the steel people were particularly optimistic. The writer was under the impression they were going a little too fast, but upon his return home he finds business much better than expected; in fact, we have about all the business we can take care of even with the throttle wide open.

Another indication of the pressing demand upon retail stocks is the number and variety of mail orders, almost every order headed, "Rush," "Please, ship immediately," "We need these goods badly." This heavy demand is of course having its effect upon stocks. We also find on a number of lines the manufacturers are not shipping promptly. In fact, just now we are reminded of conditions which existed in the memorable year of 1907. The question is, Will the volume of business continue to expand and increase? If it does, there will be danger of a runaway market.

The present large volume of business in our opinion is due mainly to two factors: First, that retail stocks, especially throughout the South, are exceedingly low. Next, the high prices being paid for cotton, corn and hogs.

Farming at present prices must be extremely profitable, and it is only natural under such conditions that the prosperous farmer should buy what he wants.

Then it is evident, on account of the resumption of factories and the increasing of the payrolls, that business in the manufacturing towns, which has been very poor for the past two years, is rapidly resuming normal proportions.

Taking it all in all, it would seem it is not necessary to jolly ourselves or to play upon the imaginations of others to realize that prosperity has returned. The practical question before us now is to keep up stock and fill our orders. At times like these manufacturers who carry complete stocks and who make prompt shipments are especially appreciated.

Our city was recently honored by a visit from the Chief Executive of the nation. He does not want to eat, but we forced food upon him. He has quit drinking, but we showed the degree of our hospitality by the number and the various shapes of the glasses lined up at his plate. His voice is gone, but we made him stand up and make signs to the multitude. In featuring him we featured ourselves; we used him as a headliner. We loaded him on a steamboat and took him down the river. And we of the Entertainment Committee who were left behind are not surprised to read in the papers that the first chance he got he told the coptain of the Oleander to put on full steam and leave all the eaters and drinkers on the other steamer behind. No doubt he was weary and wanted rest.

We await with interest the final reports of the deep waterways convention at New Orleans

Cleveland.

W. BINGHAM COMPANY.—Business conditions are certainly improving in all quarters. It is estimated that there will come down from the Northern mines by the close of lake navigation 15,000,000 more tons of iron ore than came over the same course in 1908, and the record of tons will be about the same as came down in the banner year, 1907. There is also a lot of grain coming down the lakes from the Northwest and a large quantity of coal going back, showing that the lake traffic this year is going to round up with a big tonnage to its credit.

Scarcity on many lines of goods still continues, and our daily mail is full of apologies for slow shipment of goods that we ordered 30, 60 and 90 days ago. The inrush of trade this year found many manufacturers not prepared to meet the demand.

The large consumption of all kinds of Hardware since the revival from panicky days has absorbed all the surplus that many manufacturers had on hand, and withdrawals and revision in prices seem to be the order of the day. Few, if any, manufacturers will contract for their commodities beyond the first quarter of the coming year, for the reason that they do not know just what the period beyond this date will demand, and the idea is to control the situation so that we may not have a runaway market. On some lines of goods at the present time large consumers are willing to pay a premium for prompt delivery.

Although we have no authority for saying so, we gather from information we have received that an advance in Wire and Nails, Sheets, Merchant Pipe and other commodities will probably take place in the near future. The large consumption that is going on and the scarcity of stock ond hand are given as the reasons for a probable advance in prices.

The steel mills all over the country are rushed with orders and the new business that is going on their books is very heavy, and the coming into the market at the present time of the large and substantial railroad companies throughout the country for rails, cars, engines and general supplies is quite encouraging and goes a long way to assure us of prosperous times for the balance of this year and into many months of the coming year.

The country is spreading out and growing in all sections. The trouble just now is to find cars enough to transport commodities from place to place. It behooves every dealer to anticipate his wants further ahead than heretofore, because shipments from all sections in the crowded condition of transportation companies will necessarily be somewhat retarded. Therefore, we advise our customers to stock up more liberally and forget the old panicky days, when it was advisable to order often and in small lots.

Holiday trade with us is fine. Our salesmen carry a splendid line of samples and with their knowledge of the goods they represent are reaping the benefit. Pocket Cutlery, Butcher Knives, Plated Ware, Carvers and fancy articles in the Hardware line are quite in evidence on orders. Hurry-up orders by express are very frequent, showing that country merchants are having a good, lively trade and are looking after the wants of their customers promptly. We are looking forward to the holiday season with a great deal of pleasure, believing that the efforts that we and our customers have made in the past months are going to show good results.

Baltimore.

CARLIN & FULTON.—General business conditions are improving to such an extent that again the transportation companies of the country are confronted with the difficulties of 1907 in a shortage of rolling stock with which to move the immense volume of freight offered.

Enforced economies in maintenance during 1908 by the railroads along with the decrease in gross receipts resulted in the curtailment of many needed improvements, both in construction and in rolling stock, until now it has become absolutely necessary that millions be expended for betterments as soon as possible to avoid the unsatisfactory condition of railroad traffic three years ago. One of our largest roads has found it necessary to allot cars on the percentage plan for the carrying of coal, and the fact that there is such an immense tonnage of coal to be moved is a sure proof of the great revival of business, especially in the manufacturing districts. We understand that in heavy material most of the mills are oversold, and in many cases premiums are being asked over and above the market quotations for prompt delivery. The indications are that these difficulties will increase as the season advances.

Cotton growers have reached their ambition in seeing cotton at 15 cents, which can be accounted for partly by the shortage of the crop and partly by manipulation. The planter who has had a good yield is happy, but the spinner, who has to buy, is the reverse, and if, as has been threatened, the mills shut down or curtail production, it will be a question as to whether a short crop and high price is as great a blessing as a larger crop would be with a lower price. The latter would undoubtedly distribute more money for labor, give more business for the transportation companies, and give the public the finished product at more reasonable prices, helping also the export business, which to be conducted successfully needs cheap raw material. Nevertheless it is also argued that values are fixed by supply and demand, and it is almost useless to theorize as to what a commodity should bring as long as the buyer is forced to have what the seller controls.

Bank clearings, which are to a certain extent exponents of business activity, show an increase in this city for the month of October of over $25,000,000. This may be partly accounted for by the active stock market, but only to a limited extent, and the figures very largely represent actual business transactions.

Local elections in our State have perhaps a little disturbing influence in business, especially in the rural sections, for our country cousins have always taken more interest in politics than the average city man. The market is undoubtedly strengthening, buyers are looking ahead with confidence as to the stability of values, and discounting the probabilities of advances, but competition is great among the distributers of Hardware, and the retail dealer is not allowed to pay more for his purchases than their worth as determined by the market.

Portland, Oregon.

FAILING-MCCALMAN COMPANY.—As usual, the writer can report excellent conditions in the Pacific Northwest. At the fall meeting of the Northwest Hardware Jobbers, held in this city last week, the writer saw representatives

of the principal houses from Seattle, Tacoma and Spokane, and it was the general opinion that not only would this year equal the best preceding year, but that all expect it to surpass all previous years.

We can also report excellent conditions with regard to collections, for all the crops produced in this section of the country sold at excellent prices, and the whole consuming public not only wants the goods, but is willing and able to pay for them.

One encouraging feature for the future in this country is the number of inquiries which the Hardware houses in this section are receiving from men who wish to come out here and establish a Hardware business or general store in the country tributary to Portland. We believe that other lines of business show an equally large number of such inquiries, the majority of which will materialize in the actual settlement of the inquirers. This indicates a large immediate increase in the population of the Northwest territory; an increase of the most desirable kind, people who not only come out to the country, but are willing and able to invest money in it. These are the people who make for solid and substantial growth.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Trade in this territory has shown no signs of falling off since our last letter. Orders are coming in in fairly good volume and while some of them are not up to the usual quantity conditions yet, on the whole, we think they are fairly satisfactory and with a general improvement in volume.

Prosperity seems more general and staple. The railroads and industrial corporations are enjoying a large share of profits. Cotton is high and we had feared that the rise (something close to $5 per bale) would have a tendency to cause Eastern and Southern mills to shut down, but we note from a daily paper that the talk of a shutdown north and south has ceased.

The building operations in our own city, we think, are ahead of those for many years past, and while we have no figures before us, we feel assured that in dollars and cents they total more than they have for a long time. That the general business conditions throughout the entire country are becoming more and more satisfactory one has only to read the trade reports to be convinced of the reality of the returning prosperous conditions in all sections.

Railroads are now confronting the serious question of a scarcity of freight cars, where only a short time ago they were experiencing no difficulty whatever in this direction.

We trust there may be no let up in the prosperity movement which now prevails through the country at large and while we have only two months left in 1909 we should like very much indeed to see them the banner months of the year.

Omaha.

LEE-GLASS-ANDRESSEN HARDWARE COMPANY.—Trade conditions throughout the corn belt and east and west of the Missouri River continue very satisfactory, and the volume of goods going into consumption daily progresses with a steady regularity.

The large crops of all kinds and high prices for everything produced by the agriculturist would indicate that no let up in the extent of business is at all likely. There is nothing in the situation at the present time, nor any developments in sight calculated to disturb the satisfactory volume of business now being enjoyed.

A large amount of building is in progress, consequently labor of all kinds will be well employed until the winter season stops outdoor operations. This continued activity will undoubtedly beget for us new population, and this will largely increase the consuming power, which furnishes the lifeblood to the arteries of trade.

NOTES ON PRICES.

Wire Nails.—Conditions in the Nail market remain unchanged as to prices and current demand. These are satisfactory, showing that jobbers' stocks of lower priced Nails are gradually being worked off and that new business received by the mills is in proportion to the actual requirements of the trade. The expectation of higher prices in the future has apparently not led to speculative buying. There have been unfounded rumors of withdrawals of quotations and even of advanced prices, but these simply indicate the strength of the market. Quotations continue as follows: F.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers	$1.80
Carload lots to retail merchants	1.85
Less than carloads to jobbers	1.85
Less than carloads to retail merchants	1.95

New York.—No falling off in the demand for Wire Nails is reported, business being on about the same moderate basis as has characterized the market for some time. The stocks of cheap Nails have not all been disposed of in this market, causing some unevenness in prices, but the general quotation remains on the basis of $2 per keg for small lots at store. A report current on November 1 that the mills had advanced the price of Nails 10 cents per keg was without foundation.

Chicago.—With all but an unimportant portion of the cheap contracts placed earlier in the year shipped and out of the way, orders for new business at the current price are coming in in a satisfactory volume. Some of the larger jobbers are well stocked up for the present, but the demand is fairly heavy and conditions generally favor a good fall movement. The mills could easily book a large amount of business for early spring delivery at the current schedule, as the upward tendency of prices in crude steel products strongly forecasts higher prices after the first of the year. Orders, however, are being booked at current rates only for specifications prior to January 1. We quote as follows: $1.98, Chicago, in carloads to jobbers, and $2.03 in carloads to retailers, with an advance of 10 cents for less than carloads from mills.

Pittsburgh.—A fair amount of new business is being placed in Wire Nails at the $1.80 basis, but it is evident that stocks in the hands of jobbers bought at the $1.70 price were larger than generally supposed, as these stocks have not all been worked off yet. The large trade is pretty well covered with Nails, and new buying for the next month or so is not expected to be especially active. The leading Wire Nail makers are adhering rigidly to their policy not to see Wire Nails at present prices for delivery beyond 60 days from date of contract. An advance in prices of Wire Nails in the near future is still being predicted, but this will hardly be made until the present stocks held by jobbers have been worked off. We quote Wire Nails at $1.80 base, f.o.b. Pittsburgh, in carload and larger lots for delivery within 60 days from date of contract.

Cut Nails.—The market shows a continued firmness in price, with the mills fairly supplied with contract orders. Against these specifications are being received in good volume. Under these conditions mills are not generally willing to make concessions in price to secure business. Quotations are on the basis of $1.80 to $1.85, in carload and larger lots, f.o.b. Pittsburgh.

New York.—Cut Nails are being purchased in quantities desired to meet nearby requirements. Some unevenness is caused in the market by unsold portions of cheap stocks, but the general quotation is $2 per keg, in small lots at store.

Chicago.—Prices continue firm, with a hardening tendency and jobbers' stocks are moving freely. The mills are better supplied with orders than at any time in the past two years, with prospects for growing activity ahead. We quote in car lots to jobbers, Steel Cut Nails, $1.98 to $2.03; Iron Cut Nails, $2.08 to $2.13.

Pittsburgh.—The market on Cut Nails is decidedly firm and the mills are not disposed to make concessions in prices to obtain business. All the mills have a good many contracts on their books against which buyers are specifying freely and the scarcity and high prices of Nail Slabs may possibly bring about a general advance in prices of Cut Nails in the near future. We quote Cut Nails at $1.80 to $1.85, base, f.o.b. Pittsburgh, in carload and larger lots.

Barb Wire.—The continuance of mill shipments against orders which were placed at lower prices form the larger part of mill activities. A comparatively small amount of new business is being received, and this condition will probably continue until the present stocks of jobbers are absorbed by the trade. The market is firm at the following quotations, f.o.b. Pittsburgh:

	Painted.	Gal.
Jobbers, carload lots	$1.80	$2.10
Retailers, carload lots	1.85	2.15
Retailers, less than carload lots	1.95	2.25

Chicago.—A fair amount of new business is being booked and the volume of such orders is increasing at a moderate rate. Shipments of specifications against old contracts are still going forward, a fact that indicates something of the unprecedented buying that followed the cut in prices last spring. We quote as follows: To jobbers, Chicago, carloads, Painted, $1.98; Galvanized, $2.38. To retailers, carloads, Painted, $2.03; Galvanized, $2.33; retailers, less than carloads, Painted, $2.13; Galvanized, $2.43. Staples, Bright, in carloads, to jobbers, $1.98; Galvanized, $2.28; carloads, to retailers, 5 cents extra, with an additional 10 cents for less than carloads.

Pittsburgh.—New business being placed is light, as the large trade still has fairly heavy stocks accumulated when prices were lower, and which have not yet been worked off. The mills continue to book orders at present prices only for shipment within 60 days from date of order. The market is strong, and we quote Galvanized Barb Wire at $2.10 and Painted at $1.80 in carload and larger lots, f.o.b. Pittsburgh, subject to usual terms.

Fence Wire.—The demand from manufacturers of Wire Fencing is active. These requirements represent the bulk of mill activity, as jobbers' stocks of cheaper Wire have not been sufficiently reduced to require much replenishing. The market is firm at regular quotations as follows: To jobbers in carload lots on a basis of $1.60 for Plain and $1.90 for Galvanized, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the usual price to retailers being 5 cents additional:

Nos.	0 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.60	1.65	1.70	1.75	1.85	1.95	2.05	2.15
Galvanized	1.90	1.95	2.00	2.05	2.15	2.25	2.65	2.75

Chicago.—There is a heavy demand from fence manufacturers for Wire, and some contracts of considerable size are being placed for shipment in November and December. The outlook for a prosperous trade is encouraging. We quote as follows: Carloads, to jobbers, $1.78, base, f.o.b. Chicago.

Pittsburgh.—Several of the leading makers are entering orders from manufacturers, who make up Wire into fences and other products for delivery up to April 1 of next year at present prices. This course is absolutely necessary in order to allow these manufacturers to get out in the market and take orders for their products, and at the same time be absolutely assured of what their Wire will cost them for some little time ahead. Stocks held by jobbers are still fairly large, but these are being gradually worked off, and as soon as these stocks have been disposed of new demand will no doubt materially increase.

Poultry Netting.—The manufacturers of Poultry Netting on October 19 advanced prices so that the following quotations now represent those to the general trade: Galvanized after weaving, discount 80, 10, 7½ per cent., and galvanized before weaving, discount 80, 10, 10, 2½ per cent. Many of the jobbers have been requesting the manufacturers to abolish the distinction in price between carload and less than carload lots, and this has been done by the manufacturers. Actual freight up to 50 cents per 100 lb. on shipments of 200 lb. and over is allowed.

Chalk Lines.—An advance in Cotton Chalk Lines has recently been made, the price of which in moderate quantities is now 27 cents per pound. The advances since July 1 aggregate 5½ cents per pound.

Toe Calks.—There was an advance of 20 cents per hundred weight on Toe Calks, October 25, with the customary differential of 10 cents per 100 lb. for carload orders. There is also no change in the freight allowance based on Pittsburgh, the freight being added to the price and prepaid at time of shipment.

Lace Leather.—Following the rise in leathers for Belting and various other uses, advances have also been made in Lace Leather. Opinions are expressed that present market conditions are not permanent, and some makers are not accepting orders subject to much delay in shipment or beyond more than reasonable periods ahead. Prices vary according to the customers' standing and quantity specified, but these prices represent in a general way the market on good quality Lace Leather:

No. 1 Raw Hide Lace Leather in sides 17 sq. ft. and over, per square foot, net ..... 27c.
No. 2 Raw Hide Lace Leather in sides under 17 sq. ft., per square foot, net ..... 26c.

There are also some brands of Lacing Leather which vary from 25 cents per square foot to 30 cents per square foot, according to quality, and 50 per cent. discount, respectively.

Glue.—Glue since August 1 has maintained a firmer tone throughout the line than was observable during the two years of depression. This is especially true of the cheaper Glues. Prices are ranging from about 6 cents to 25 cents per pound, according to quality and the purpose for which it is fitted. There is now a better demand and so far there has been no material advance in price. October business showed more activity and merchants in some instances have been providing for the future by laying in stocks. A peculiarity of the Glue business is the fact that Glue cannot be advantageously made in summer in this latitude and territory. Manufacturing is carried on generally between the beginning of October and the middle of May. It is difficult to make it when the weather is hot and humid, on account of the difficulty experienced in drying. When manufactured in warm weather it spoils quicker.

Wire Clothes Lines.—At a recent meeting of manufacturers of Wire Clothes Lines prices were reaffirmed.

Jobbers' Prices to Retail Merchants.—As illustrating the prices at which retail merchants are purchasing from Western jobbers, we have the following advices from a merchant in that territory. It will be observed that they conform substantially to those quoted in our Current Hardware Prices, indicating the accuracy with which the market is thus represented:

	Discount.
Common Auger Bits	80 %
Common Tackle Blocks	75 and 10 %
Jack Chain	70 %
Compasses and Dividers	75 and 5 %
Common Braided Sash Cord, No. 7, 23½ cents; No. 8, 23 cents, in 12 dozen lots.	
Cork Lined Faucets	60 %
Good Grade Files	80 %
Molasses Gates	80 %
No. 1 Hatchets	60 %
No. 2 Hatchets	60 and 10 %
Railroad Picks	75 %
Button Pliers	75 and 10 %
Square Corn Poppers	1 qt. $0.75; 1½ qt., $1.20; 2 qt., $1.50
Pitcher Spout Pumps	80 %
Spring Punches, 1 tube	$1.75
Spring Punches, revolving, 4 tube	$3.50
Copper Rivets and Burrs	50 and 10 %
Union Platform Scales, striped	$2.25
Jack Screws	75 %
Flat Head Wood Screws	90 %
Hunter's Imitation Sifters, gross	$9.00
Wood Handled Try Squares	70 %
Imitation Oneida Game Traps	75 and 10 %
Agricultural Wrenches	80 and 5 %
Bright Wire Goods	90 and 30 %

Our correspondents who furnish the above quotations are merchants who give careful attention to their buying, thus obtaining prices which are not always secured by merchants who give less care to this department of business. It will be noted, too, that in one or two of the lines mentioned advances in price have recently been made which in due course will presumably be represented in quotations made by the jobbers.

Sash Cord.—Common Braided Sash Cord was advanced 2 cents per pound October 27, owing to the high and advancing price of cotton. The Cord market is strong, and manufacturers are generally well filled up with orders at the lower price, which has been ruling for some months. There is considerable diversity in jobbers'

prices, who have stocks of Cord bought lower than present prices. It is estimated that not more than 60 to 75 per cent. of the Cotton Sash Cord manufactured is used in hanging Sash Weights, much of it being used for Clothes Lines and other purposes. In former times high prices reduced the use of Cotton Sash Cord for all purposes, and there has been a good deal of substitution of cheaper grades of Cord.

Anvils.—The manufacture of Anvils of American and Swedish production have established a base price per pound, f.o.b. New York, Philadelphia, Columbus, Ohio, and New Orleans. Excess freight over a definitely established rate will also be allowed for Pacific Coast points, viz., Los Angeles, San Francisco, Portland and Seattle.

Rubber Pad Horseshoes.—Owing to the sustained high prices for crude rubber, higher prices are being named for Rubber Pad Horseshoes. This is accomplished not by a change of discount, but by a readjustment of the list, effective November 1. The increases in a general way vary from about 10 per cent. on the smaller sizes to 20 and 25 per cent. on the larger ones, because of the much greater amount of rubber required. Even now the large Horseshoes, it is asserted, are below cost.

Solid Box Vises.—Solid Box Vises, such as used generally by blacksmiths, advanced 10 per cent. November 1 in some quarters. This line has been in an extremely unsatisfactory condition for a long time, which has of late been aggravated by the higher metal market. There, however, appears to be no concerted action by producers, but while some of them are quoting much higher than formerly there are others whose prices, though advanced somewhat, are still materially lower than those of other manufacturers.

Gem Wire Hat and Coat Hooks.—The Columbian Hardware Company, Cleveland, Ohio, on November 1 made an advance on these goods of about 10 per cent.

Sash Weights.—Sash Weights show stronger tendencies in price both East and West, with advances generally $1 to $2 per ton. In New York the prevailing price is $25 per ton, central Pennsylvania $27.50 for less than carloads and $26 in car lots. Points in Ohio and the Middle West have a range of $24 to $26, with a fair demand. Eastern New York, favorably located to reach New England points, $27.50 in less than carloads and $26 in car lots, is being named. One of the causes for higher costs in Sash Weights is the increasing difficulty in obtaining raw materials. Scrap Tin, Wire Scrap and other material was formerly obtainable by Sash Weight manufacturers for about $5 per ton, but has advanced to $8 to $9 per ton. Formerly the making of Sash Weights was practically independent of the scrap market, because of abundant and cheap raw material, which at present is otherwise used. Now there is more dependence on Borings, Stove Plate, Grate Bars and Machinery Scrap. This tends to compell higher prices. There is also an increased demand owing to larger building operations.

Rope.—A continuance of improved demand is reported among the trade, as there is a slight increase in sales for October over those of the preceding month. The fiber market holds firm with no advances in price, but with a fair buying movement by Cordage manufacturers. Increased firmness is reported in Jute goods. The market is represented by the following quotations: Pure Manila of the highest grade, 8 to 8¼ cents per pound; lower grades of Pure Manila, ¼ to ¾ cent less than the foregoing quotations. Pure Sisal of the highest grade, 7½ to 7¾ cents per pound, base; Commercial grade, 6¼ to 6½ cents per pound. Rove Jute Rope, ¼ in. and up, No. 1, is quoted at 5 to 5½ cents per pound.

White Lead in Oil.—The demand for White Lead in Oil continues steady and seasonable. The scarcity and high price of Linseed Oil has had a strengthening effect upon the price of Lead in Oil without, however, advancing prices. Quotations are as follows: In 100, 250 and 500 lb. kegs, 6¾ cents per pound; in 25 and 50 lb. kegs, 7 cents per pound, with the usual advances on smaller packages.

Window Glass.—The meeting held by the manufacturers last week failed to complete the organization of the Imperial Window Glass Company, as certain interests had not signified their willingness to sign contracts. It is the view of the committee that the movement should have the co-operation of all the manufacturers, so that there may be no outside disturbing factor. Another conference will be held this week. The impression has gone abroad that there are encouraging features in the situation that point to the ultimate success of the project. The increased firmness of manufacturers in the matter of price has possibly had something to do with less active buying during the past week. Prices recommended by the Eastern Window Glass Jobbers' Association, from jobbers' list, October 1, 1903, for territory east of the Allegheny Mountains, are as follows: New England States, from jobbers, Single, 90 and 30 per cent., and Double, 90 and 35 per cent.; New York State, Single, 90 and 30 per cent., and Double, 90 and 35 per cent.; New York State, factory shipments, Single, 90 and 40 per cent.; Double, 90 and 45 per cent.; in the Southern States discounts vary from 90 and 20 to 90 and 30 per cent. on Single and from 90 and 25 to 90 and 40 per cent. on Double. These prices are not always strictly adhered to.

Linseed Oil.—No further advances have taken place in the price of Oil, nor has supply become any larger. Practically all old Seed has been used, and crushers are dependent upon the new crop which is coming into Minneapolis and Duluth slowly. Estimates at first made of the amount of the new crop have been reduced, and some fear that there will not be enough Seed for domestic requ'rements until the next crop. However, this may be fear is expressed that Eastern crushers may not be able to get enough Seed shipped before navigation closes to last them until it opens in the spring, as, according to reports, lake steamers prefer iron ore to Flax Seed for freight, so that it is difficult to secure water transportation. The extra cost of all-rail freight would be about 15 cents per bushel. This would give Western crushers an advantage over those in the East to the amount of the difference in freight. Buyers of Oil are having difficulty in getting all they require for immediate needs, and are getting along the best they can under the conditions. Oil may be higher before it is lower, but if demand diminishes and receipts of Seed increase prices may ease off somewhat. The market is strong at the following quotations: Raw Oil, 62 cents per gallon in lots of five barrels or more; in less than five-barrel lots, 1 cent advance. Boiled Oil is 1 cent advance per gallon on Raw.

Spirits Turpentine.—There has been comparatively little doing in the local market during the week under review. Business has been confined to jobbing lots sufficient for immediate requirements. New York quotations are unchanged as follows: Oil Barrels, 61 to 61½; Machine Barrels, 61½ to 62 cents.

R. H. LAKE has retired from Lake's C. O. D. Store and the Lake Hardware Company, Greenville, Miss., of which he was proprietor. Mr. Lake will move to San Francisco, Cal., where he will open an office for the purpose of representing manufacturers to the Pacific Coast trade. He will be pleased to hear from any manufacturers desirous of such representation. Up to about December 1 he may be addressed at Greenville, Miss., after which time he will be located in San Francisco.

THE UTICA DROP FORGE & TOOL COMPANY, Utica, N. Y., makes an unusually strong guarantee on its Pliers and Nippers. Since this line was first placed on the market, the policy of the company has been to let no tool go out of the plant that it would not be willing to take back if injured or broken in work. Every Plier and Nipper is, we are advised, subjected not only to expert inspection, but to the most severe tests before leaving the factory.

THE ROGERS-BAILEY HARDWARE COMPANY has lately opened up in the wholesale and retail business at 617 Market and 618 Broad streets, Chattanooga, Tenn. The officers of the company are: J. C. Parks, president; L. D. Bailey, vice-president; A. H. Rogers, secretary and treasurer, and R. L. Ramsay and J. A. Kuss, directors, all of whom have previously been identified with the Fritz Hardware Company for periods of service ranging from 10 to 20 years.

Economy in Freight Transportation.

Consolidation of Less Than Carload Shipments Into Carloads.

Pointers for Small Shippers and Receivers of Freight.

BY A TRAFFIC MANAGER.

IT is the intent of the Interstate Commerce law to provide against discriminations in any form between persons, companies, firms, corporations or localities on any particular description of traffic; and while it is unlawful for any common carrier amenable to the law to subject any particular person, company, firm, corporation or locality to any undue unreasonable prejudice or disadvantage in any respect whatsoever, the fact remains, however, that many of the smaller shippers and receivers of freight suffer a disadvantage by the application of carload rates on articles so provided for in the freight classifications, in the sense that the smaller shippers not being able ordinarily to ship in carloads, are subjected to the less than carload rates on all their traffic, the less than carload rates as a rule being higher than the carload rates on the same articles.

This Disadvantage Is Not Due

to the law itself nor to the interpretation of the law; nor to the application of the rules, regulations and requirements given in the freight classifications; nor to discriminating practices, rates and charges. **To a large extent it is due to the fact that the smaller shippers and receivers of freight, as a rule, do not take advantage of what is permitted under the law, namely, the consolidation of less than carload shipments into carloads.**

To render the consolidation of less than carload shipments into carloads practicable requires the co-operation of shippers and receivers of freight, a knowledge of freight classifications, freight rates and the rules, regulations and requirements relative to carload shipments, for sometimes it may not be economical or desirable, and an acquaintance with the customs and methods established for handling such business, the manner of marking goods, executing shipping papers, routing, forwarding and delivering.

The Basic Rule.

The basic rule (5 B) in the Official Classification as regards the application of carload rates is as follows:

> In order to entitle a shipment to the carload rate the quantity of freight requisite under the rules to secure such carload rate must be delivered at one forwarding station, in one working day, by one consignor, consigned to one consignee and destination, &c.

Railroads Not Favorably Disposed to the Practice.

It is pertinent here to note, and it is of the highest importance that all shippers, and particularly the less than carload shippers and receivers of freight should know, that railroad companies are not particularly favorable toward the practice of combining less than carload shipments into carloads and applying the established carload rate thereon.

They have from time to time sought to diminish the privilege by modifying the aforesaid Rule 5 B, and by establishing new rules limiting the application thereof, such as the rule prohibiting railroad agents from acting as the representative of consignor or consignee for the distribution of carload shipments. Also the note to rule 5 B making the rule applicable only when the consignor or consignee is the actual owner of the property, and the rule requiring forwarding agents combining shipments into packages to declare the names of individual consignors and real consignees to the forwarding railroad agent and requiring such shipments to be waybilled and charges assessed as for separate shipments.

Additions and Amendments Declared Illegal by the Interstate Commerce Commission.

While these additions and amendments to Rule 5 B are incorporated as part of the Official Classification they have been declared illegal by the Interstate Commerce Commission and in instances where the Interstate Commerce Commission has been appealed to the commission has issued orders for reparation to the shippers of amounts equal to the difference between the less than carload rates assessed and the carload rates which the commission maintains should have prevailed.

The railroad companies have appealed to the courts for an injunction restraining the enforcement of the commission's orders, which has been granted. This injunction is to be followed by an appeal by the commission to the Supreme Court of the United States for a final decision as to the legality of the rules in question. In the meantime the practice is tacitly permitted with little objection.

Official Classification Territory Most Favorable.

The foregoing applies particularly to official classification territory, in which the classification provides carload rates for about 72 per cent. of the articles named in the classification, and also permits all articles taking the same class in carloads to be shipped in mixed carloads at carload rate, proper details being provided as to rates and minimum weights at which such combined shipments will be carried.

In the Western classification territory there is a distinct provision against the combination of two or more articles of a single ownership having the same or different carload ratings for the purpose of obtaining the carload rate, except as such combinations may be specifically authorized in the classification. The carload ratings in the Western classification amount to only about 30 per cent. of the less than carload ratings.

The specific provisions in the Southern classification for combined carloads are even more limited in number and extent of mixture than those authorized in the Western classification, the number of carload ratings in the Southern being about 22 per cent. of the less than carload ratings.

How Consolidation of Shipments May Be Effected.

Consolidation of less than carload shipments into carloads may be effected by employing forwarding agents to collect less than carload shipments from different consignors, combine such shipments into carloads and ship in the name of the forwarding agent or of the owner of one of the less than carload shipments, to one consignee who may be the forwarding agent himself, another forwarding agent at the point of destination with whom he has business relations, or the owner of part of the property transported.

The consignee of the shipment receives the carload and distributes its contents to the parties for whom they are intended; or the forwarder may be eliminated from the transaction by a number of individuals or corporations associating themselves together for the purpose of combining their less than carload shipments into carloads to secure carload rates and employing the traffic manager to effect such combination. Sometimes individuals and single firms or corporations doing considerable business find it profitable to effect consolidation on their own account.

Examples of Combining Shipments.

The following illustrations will make clear the method which may be followed in combining smaller shipments into carloads:

A factory in Chicago, Ill., manufacturing an article subject to second-class rates in less than carloads and fifth-class rates in carloads, and having orders in its

possession by arrangement or otherwise, from several business firms in New York City sufficient in weight, if combined to meet carload weight requirement of the article to be shipped would, to secure carload rating, deliver in its own name all the goods called for in the various orders in one working day, to one forwarding station in Chicago, marked and consigned to one consignee and destination, which in this instance would be one of the New York City firms owning part of the property.

The goods for each New York City firm could be distinguished one from the other by number, letter or other mark on packages arranged for by shipper and consignee.

Upon receipt of arrival notice from railroad company consignee would pay freight charges if any, take the portion of carload belonging to him and issue orders on railroad agent to other part owners of the carload who on presentation of orders at railroad station where shipments were held for delivery could secure their goods, each sorting out his own packages. The railroad agent is prohibited from aiding in sorting or distributing combined shipments to two or more consignees.

Or, a manufacturer of Agricultural Implements at Rochester, N. Y., having secured a number of orders calling for less carload shipments to various points in Minnesota, might effect a saving by combining the shipments and forwarding at carload rates to St. Paul, Minn., and reship again from St. Paul at less than carload rates to the respective destinations.

Shippers or Consignees Need Not Be Located at Same Point of Shipment or Destination.

Again it is not necessary that the individual shipper or consignee be located at the same points of shipment or destination. For instance: If a reduction in rates could be effected, a manufacturer of machinery at Fitchburg, Mass., having a less than carload shipment for a point in Illinois, and another manufacturer of machinery at Providence, R. I., having a less than carload shipment for a point in Michigan, might forward their shipments at the less than carload rates to Boston, Mass. There the two shipments could be consolidated and forwarded at carload rates to Chicago, and thence shipped again at less than carload rates to their respective destinations.

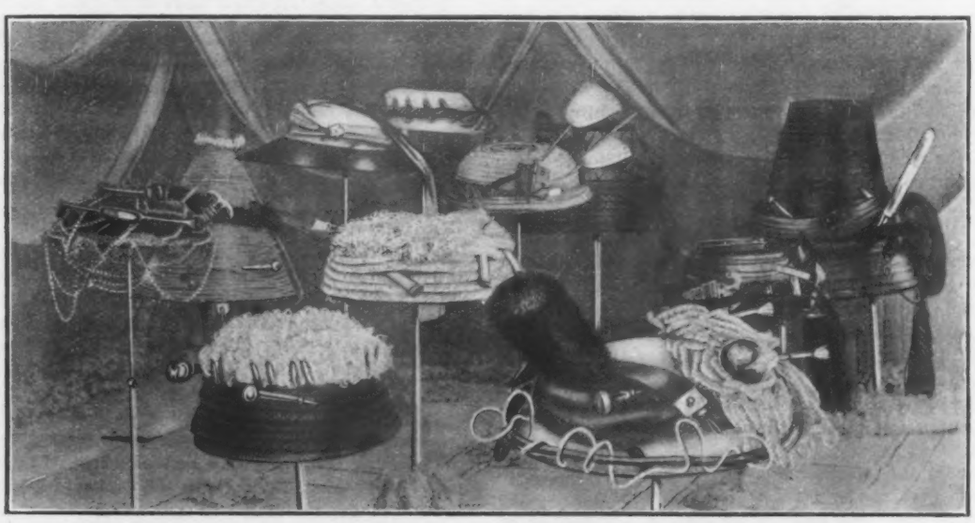
Hardware Millinery in the Show Window.

THE aptitude shown by the Hardware trade in "taking off" the millinery monstrosities which have been so prominent for the past year or so, is not to be wondered at, as retail Hardware merchants are coming to be famous at arranging unique and attractive window displays. This is a fruitful field for ingenuity, combining as it does most unusual things in harmonious arrangement as hat trimmings and at the same time imparting the characteristic style for which such prices are paid by the ladies.

A notable example of this adaptation is afforded in the accompanying reproduction of a display made by the Gainesville Hardware Company, Gainesville, Fla., and arranged by H. R. Wilburn, one of its employees. The company's show window is 8 x 8 ft., and Back Band Webbing was used for ribbon decoration. For the floor and background white crêpe paper was employed, while white cotton waste was also used for decorations around the stands, &c.

Commencing at the right hand side of the illustration the first hat was composed of a Dish Pan on which was set an Enameled Water Pail. It was trimmed with square Hemp Packing, a Ham Knife and Awls, the ribbon sash being Lath Yarn. The frame of the next hat was a Wash Basin, on which was a Chesterman Measuring Tape, Lath Yarn, Refrigerator Hinge, Paint Brushes and Ice Picks.

The third hat was a White Enameled Wash Basin with Sash Cord binding and Red Rubber Gasket Packing for braid. On the top was a Floor Mop for willow plume, Baseball for rosette, Razor Strop and Counter Duster, and Stenciling Brushes for hat pins. The next hat had a body of Tin Pan on which was a Peck Measure trimmed with Jute Packing, Brass Jack Chain, &c. Hat number five was a White Enameled Wash Basin for body, trimmed with ⅜ in. Cotton Rope, Fly Killers, Dog Collars, &c.



An Imposing Array of Millinery Made from Hardware Articles.—A Window Exhibit by the Gainesville Hardware Company, Gainesville, Fla.

The hat next in order was a large Pudding Pan covered with large white rope Asbestos Packing, a set of White Handled Carvers for plumes and White Waste for top of crown. The last hat on the bottom row was an Enameled Cuspidor, wound with two long Florida Plaited Cow Whips, White Waste top, Brass Keyhole Escutcheons around the edge and Ice Picks for hat pins.

The hat at the extreme left was a Wood Fiber Basin with Dog Chains, Dog Collars, &c., for trimming. The next one, to the right, was a conical 8-in Galvanized Pail, with trimmings of 5-16 in. Cotton Rope, Brass Curtain Rings, Brass Hinges, Ice Picks, &c. Then came a Store Lamp Shade of large size, on which was a White Enameled Wash Basin for crown, trimmed with Plow Back Band, Brass Hinges, &c. This was followed by a White Enameled Wash Basin with Jute Packing Sash, trimmed with Brass Keyhole Plates.

The decorations for the window cost less than $1.50, and the exhibit attracted more attention than any window display in Gainesville for many moons.

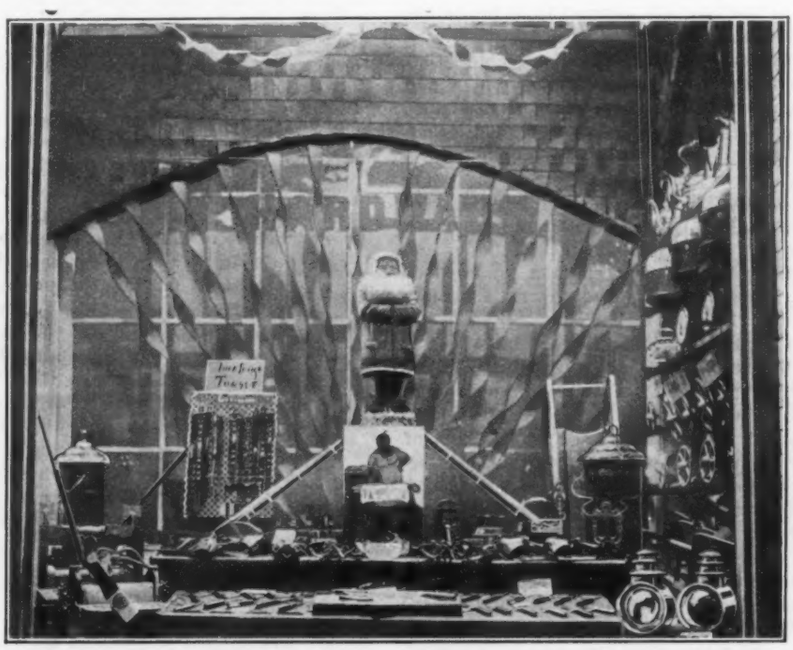
E. S. Viken has established a retail Hardware business, handling also Stoves and Tinware, at Garner, Iowa.

Going After Christmas Trade.

Attractive Holiday Display of a Pennsylvania Firm.

A WELL dressed holiday window, which offered a strong appeal to Christmas shoppers, is shown herewith. It was made by Geo. D. Boggs & Son, Elizabethtown, Pa., during the holiday season last year. The place of honor in the center of the display was given to a figure of Santa Claus, which stood upon a pedestal about 2 ft. high.

In front was a display of Pocket Cutlery, and Carvers flanked by Wringers on one side and Carriage Lamps on the other. Back of these were arranged Ice and Roller Skates, Asbestos and Mrs. Potts' Sadirons, Telescopes, Oil Heaters, Coaster Wagons, Sleds, Hobby Horses, Food Choppers and Carpet Sweepers. To a hand-



Tempting to Holiday Shoppers.—Window Exhibit of Geo. D. Boggs & Son, Elizabethtown, Pa.

some sample board of Dog Collars was attached a sign reading

DON'T FORGET TOWSER

The side of the window was occupied by a skeleton frame supporting glass shelves, on which were shown Nickeled Copper Ware, Roasters, Carriage Heaters, Family Scales and Children's Wagons.

The background was an arch covered with red and green crêpe paper in checkerboard effect, with twisted strips of the paper fastened at the bottom and drawn together on the floor in the center of the window.

Getting Next to the Boys and Girls.

THE Hoyt Hardware Company, Wellsville, N. Y., advocates and follows the policy of cultivating the boys and girls, believing that their acquaintance and patronage are a valuable asset both for the present and for the future. "We simply want," the company writes, "to get the boys and girls to thinking of us as leaders, so that if mention is made of our concern they will at once remember what and where we are." About a week previous to Christmas last year the company inserted the following advertisement in the local paper:

> **500** { BOYS and GIRLS
>
> under 16 years of age will be admitted to the STAR THEATRE
>
> **FREE**
>
> on Thursday and Friday, Dec. 24 and 25.
>
> We'll give you the tickets. Come Wednesday and Thursday and get them. Only one to a person.
>
> **Hoyt Hdw. Co.**

The company further writes: "About as good an ad as we have had was the giving out of several hundred potted

Christmas Ferns to Ladies

who would call at the store the last three days before Christmas. We did not ask them to buy any goods to get the ferns, nor did we solicit any business from them when they were in, but had goods so arranged that they could not miss them, and we did 50 per cent. more business the day before Christmas than on the same date in 1907, partly, we think, as a result of the little souvenir."

THE INTERNATIONAL HARVESTER COMPANY has lately commenced the publication of a monthly magazine in the interest of its business under the title, "The Harvester World." The first number, that for October, contains a good deal of interesting and entertaining matter, and in the early pages gives portraits of the executive officers of the company, its general and division managers and its sales managers.

MILES A. HOFFMAN of Miles A. Hoffman & Co., 43-45 Great Tower street, London England, importers of American Hardware, has just arrived in this country for a month's stay. He will visit manufacturers of specialties having products suitable for English and Colonial markets. Mr. Hoffman's address while in America will be care of the Union League, Philadelphia, Pa.

Fire Insurance and Prevention as Related to Credit.

AT the recent annual convention of the National Hardware Association at Atlantic City extracts were read from a voluminous address on the subject of fire insurance as related to credit, made by Powell Evans, president of the Merchant & Evans Company, Philadelphia, before a Northwestern fire underwriters' association a few days previously. Mr. Evans is chairman of the Fire Insurance and Prevention committees of the National Association of Manufacturers, National Hardware Association and National Association of Credit men, and has given much attention to the subject. We give the following extracts from his address:

Insurance and its antithesis, fire loss, is not necessarily a dry subject, as the salvage corps can testify, but it is certainly a serious one, and should be discussed more with a view to interesting than entertaining you.

Credit is a derivation from the Latin "credo," I believe. It is the belief that any obligation will be met as agreed. It embraces the moral as well as the material obligation. Its warrant is sealed by the fact that the obligation incurred is finally met. Between incurring and meeting an obligation lies that gulf of the unforeseen which we bridge by hope and belief, whose values are measured by our resources, knowledge, caution, courage, energy and good intent. Yet with all these present in quantity and quality, we must still allow for the elements of the unexpected and the uncontrollable. Add the total of these last named, and add further the cost and reward for providing surely and adequately against them, and the result is the cost of insurance, which, by methods known to all, is distributed as a tax over the country at large.

It follows clearly and logically that insurance is an essential in sound credit—always against the elements which experience has shown on the average to be dangerous and widely on life. The creditor in any form should justly be relieved of the risk of accidental or elemental destruction of the basic security after taking the moral and commerical risk commensurate with the return, even without such destruction being considered. On such a limitation of risk only can average solvent credits be continuously extended. The borrower who neglects or declines to insure should justly pay the usual charge for credit plus the cost of insurance in each case.

Hence the obligation for insurance in all mortgages and deeds of trust and the wisdom of demanding it on all buildings and personal property and merchandise used as a basis for loans or credits from banks or generally in commerce.

Safe Insurance and Sound Credit Inseparable.

I therefore believe that in principle and practice safe insurance and sound credit are inseparable in solvent commerce. Self-interest as well as this principle have worked to make the use of insurance almost universal, but the average banker and merchant of the country yet find sufficient negligence on the subject to demand a sharp eye on this element of credit and should take deep interest in sound State laws regulating it.

Assuming, therefore, as an axiomatic premise, that insurance should be universal on destructible property, the logical conclusion is that insurance should be

(1) Safe and easy to buy and

(2) As cheap as controllable conditions permit. Insurance is a paradox in that it must be cheap yet dear, and easy yet difficult to obtain—that is, so simple and sure in contract terms as to be understood by all, and so low in cost as to be purchasable on any reasonably good moral risk and physical fire hazard, yet so safeguarded against improper purpose and so dear on unduly hazardous property that it may be almost unprocurable, with commercial penalties to follow this condition.

The first point covers the whole range of relations between the insured, the agent and the insurer; the proper form of policy and law relating thereto; the reasonable control of the broker; the energy of the survey and inspection bureaus; the financial condition and solvency of the companies, with public knowledge of their condition and their control by the State.

The second embraces the subject of fire loss and its cost, and fire prevention—in all its phases of building construction, protection and occupancy—to reduce it.

A Broad Subject.

These relations are so ramified and interwoven, as you well know, that they cannot be briefly set forth with any degree of clearness, nor is it necessary here to attempt more than a reference to the many details. All the great branches of political, financial, commercial and engineering problems are involved. The issue of paramount importance, it almost goes without saying, is the total fire waste and related losses, with the resultant cost of insurance, and the method to reduce both of these—in fact, the broad subject of fire waste and fire prevention.

Now, the special purpose I have in addressing you to-day as a merchant and manufacturer, and more remotely a banker, is to emphasize the fact that we already know that all these problems exist, and one by one we know many practical methods of ameliorating them all. We have experts—individuals and bodies of men—who, point by point, can advise us authoritatively of all evils in this connection that are excessive, and how to grapple with them. We know, in fact, a great deal about what is wrong, how it is wrong and how it can be bettered, in detail.

We recognize that the United States fire waste is notoriously ten times greater than in western Europe, and that it should be practicable to reduce it at least two-thirds—and yet it keeps growing, and we have so far not succeeded in controlling or reducing it. Why? Because we are not all pulling together and in the same direction at the common load. That is a large part of the answer. It is the same message Æsop gave ages ago in his fable of the father who showed his sons that single sticks, one by one, could easily be broken, but bound together, were unbreakable. It is the old motto, "Divided we fall, united we stand."

Mr. Evans then touched on the control of the insurance business and the need of united action for better handling of the business, citing some of the Government, commercial, engineering and other interests working on the problem. He referred to his efforts to interest national bodies in the work and gave a résumé of the information available. He deprecated the issuance of excessive insurance on the request of the insured or on the solicitation of the brokers for the purpose of increasing their business. He pointed out ways to reduce fire risks and advocated the assembly of a congress of interests to dispose of the matter of fire loss in a manner in accordance with its importance.

THE WOODBURY WHIP COMPANY, Rochester, N. Y., will remove its business to Westfield, Mass., the center of the Whip industry, where it will occupy a new building which has been erected especially for its requirements. The larger quarters will enable the company to care properly for its increasing business. The removal will be made during November and it is expected that the factory will be in complete running order by December 1.

The McAllister Hardware Company, Lumberton, N. C., has purchased ground in St. Pauls, N. C., where it will erect a two-story store building, 25 x 70 ft. This branch will be in charge of J. C. Blanchard.

Requests for Catalogues, Etc.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM THE CRAIG SUPPLY COMPANY, which has been incorporated in Greenwood, S. C., with a capital stock of $10,000. The company handles a general stock of Hardware, Stoves, Tinware, House Furnishings, Agricultural Implements, Paints, Oils and Sporting Goods.

FROM SHOWALTER & WILSON, who have succeeded J. A. Showalter, La Crosse, Kan., carrying Shelf Hardware, Stoves, Tinware, House Furnishings, Agricultural Implements, Sporting Goods, Buggies, Wagons, Windmills, Pumps and Pipe.

FROM J. W. NEILY, 121 South street, Baltimore, Md., manufacturer and jobber of Oars, Tackle Blocks and Marine Hardware, who is about to add Launch Hardware and Fittings to his other lines.

FROM A. C. RYAN, who has engaged in the Agricultural Implement business in Toledo, Iowa. The business will be under the management of P. J. Ryan.

FROM W. N. YONTZ, who is about opening a retail store in Corning, N. Y., handling a general line of Hardware, Housefurnishings, Paints, Oils and Sporting Goods.

Opening of the Goodell Company's Power Plant

THE formal opening of the new Goodell Company's electric power plant at Antrim, N. H., to which reference has already been made in these columns, occurred October 20. The event assumed considerable importance, ex-Governor Goodell, president of the company, having invited all the former Governors of the State, many of whom were present, as well as numerous other State officials and leading business men. The plant has a capacity of 800 hp. The company manufactures largely Table Cutlery and Hardware specialties, and has a branch house at 10 Warren street, New York, in charge of G. J. Turnbull.

THE MASSACHUSETTS SAW WORKS, Chicopee, Mass., has prepared Hack Saw Blade cost selling price-lists, which it intends to supply to jobbers for distribution to retail merchants stocking Victor Hack Saw Blades. The lists are furnished on two hinged stiff board covers bound in black cloth, with eyelets through which a cord may be passed for hanging. In the list the manufacturers have tried to give in concise form all possible assistance to a clerk filling an order for Hack Saw Blades.

THE QUINCY PATTERN COMPANY, Quincy, Ill., manufacturer of Artistic Wood and Metal Stove Patterns, has resumed operations in its metal department, which has been equipped to turn out strictly first-class work. The company has an extended experience in the making of Aluminum Match Plates, and can fit up suitable Metal Patterns for these plates. Stove men are invited to call upon or write the company for sketches, information and prices.

THE NOBLE BROS. COMPANY has succeeded to the business of Burns & Noble, Lampasas, Texas, and will transfer the stock, valued at about $30,000, to Brady, Texas, before November 15. The company will do a retail and wholesale business in Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils and Sporting Goods.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of new catalogues, price-lists, &c., for notice in this column and for filing in our Catalogue Department.

NOBLE & WESTBROOK, 9 Asylum street, Hartford, Conn.: Catalogue No. 34 illustrating Rubber Stamps, Stencils, Steel Stamps, Burning Brands, Checks, Badges, Door Plates, &c., Corporation and Notary Seals.

A. J. DEER COMPANY, Hornell, N. Y.: Catalogue illustrating and describing Royal Electric Coffee Mills for both direct and alternating currents, and Royal Roaster and Meat Choppers for alternating current. Net price-lists accompany the catalogue.

HANOVER WIRE CLOTH COMPANY, John M. Hart Company, Commercial National Bank Building, Chicago, Ill., exclusive sales agent: Catalogue relating to the Hanover Window Screen Wire Cloth.

CHAS. E. MILLER, 97-101 Reade street, New York: 1910 advance illustrated price-list of Motor Car, Motor Boat and Motor Cycle Parts, Fittings, Sundries, Tools and Clothing; also American and European novelties in Automobile Accessories, &c.

GABEL MFG. COMPANY, Hawkeye, Iowa: Circular showing Twentieth Century Pig Forceps and So E Z Pig Takers.

COMPUTING SCALE COMPANY, Dayton, Ohio: Catalogue relating to Dayton Moneyweight Computing Scales, made in the following styles: Automatic platform, multiple beam, candy and spice, noncomputing automatic; even balance nearweight, noncomputing and automatic; pendulum automatic portable computing, &c.

KNAPP ELECTRIC & NOVELTY COMPANY, 511-513 West Fifty-first street, New York: Catalogue No. 20 illustrating Miniature Electric Specialties, including Motors, Dynamo Motors, Thriller Magneto, Trains and Trolleys, Track, Rail Tie Connections, Reversing Switch, &c.

PROGRESS COMPANY, Rand-McNally Building, Chicago, Ill.: Illustrated circular of the Knickerbocker Spray Brush for shampoo, bath, massage, &c.

VOSSELLER, SEBRING & NORTHROP, 75 Warren street, New York: Circulars illustrating and describing Tomilson's Pattern Shot Gun Cleaner and the Kilgore Automatic Cap Pistol.

MICA MFG. COMPANY, 307-309 West Broadway, New York: Catalogue relating to Mica Commutator Rings, Washers, Segments, Tubes, Bushings, India, Amber and Domestic, Cut and Uncut, Plate, Cloth, Paper and Tape, all of mica; Oiled cloth, paper and Tape; also Special Mica Insulation.

BUTLER BROTHERS, New York: Santa Claus Edition of the firm's catalogue, containing 460 pages, in which goods for holiday trade are made prominent. Suggestions are given on holiday advertising, business plans, window dressing and how to close out slow selling goods bought for holiday trade.

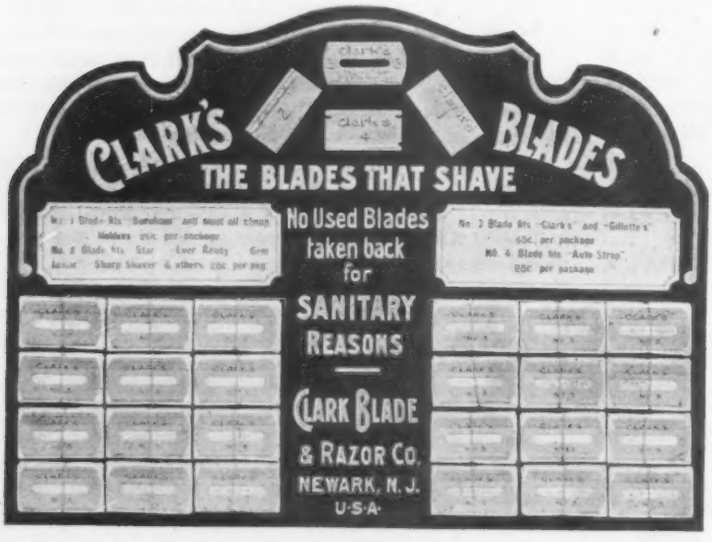
Probing the Express Companies.

THE hearing set for October 18 as the result of a petition for an investigation into express matters covering rates, deliveries and other causes of complaints was postponed at the request of the express companies until November 8. The hearing will take place, as previously arranged, before the Public Service Commission, Second District, in the assembly room of the Merchants' Association of New York City, at 54-56 Lafayette street.

The Merchants' Asssociation has been and is now in communication with a large number of complainants who have sent letters and data to the association in order to secure individual attendance from well distributed sections of New York State, so that merchants and others interested may relate experiences and give testimony at first hand. Personal attendance, it is recognized, will accomplish more than the submission of let-

ters, documents and other matter, for some phases of the investigation, which will be reinforced by the material on hand and being collected. The purpose has been to select typical cases in each class to furnish the commission substantial grounds for complaints, and direct from original sources.

The association is also having an expert analysis made of a few of the express companies, based on such data as is obtainable. An examination is likewise being made of court decisions and the operation of railroads and public service commissions in other States. One of the objects of this procedure is to show the existence of similar abuses in various States and the cognizance already taken of them, together with the relief granted.



Clark's Safety Razor Blades for Leading Safety Razors in Packages of Six on Easel.

Safety Razor Blades and Easel Display.

THE CLARK BLADE & RAZOR COMPANY, 56 Summer avenue, Newark, N. J., is manufacturing, in addition to the Clark Safety Razor, just put on the market, a line of wafer Safety Razor Blades for various well-known Safety Razors, both single and double edged. It is also putting up in easily salable form for the retail trade and counter or show window display four distinct Blades, suitable for the numerous Safety Razors, one of which is Clark's No. 1. This blade is 1 9-16 in. long, ¾ in. wide and, having no back, will fit many holders, and retails at 20 cents per package of six. Clark's No. 2 is 1 7-16 in. long, ¾ in. wide, with back, and will fit the "Star," "Ever Ready," "Gem Junior," "Shrp Shvr" and others, retailing at 25 cents per package of six. Clark's Two-Edge Slotted Center is 1¾ x ⅞ in., fits the Clark and Gillette Razors and retails at 45 cents per package of six. Clark's No. 4 is 1 9-16 x 23-32 in., single edge, and will fit the Auto-Strop Razor, retailing at 25 cents per package of six. The Blades are put up in packages of six each, displayed on an easel with suitable advertising matter, as illustrated herewith, 24 packages or 144 Blades in all of any one kind, but not assorted. All the Blades, however, are illustrated and priced on each easel, from which to show customers and sell from. The Blades are made of a special steel, .009 in. thick, have a long bevel and are well hardened and tempered.

Stivens & Vernon have succeeded W. R. Birdwell in the Hardware business in Hatton, Wash.

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Hardware and Ironmongery in Australasia.

Triumph of American Manufactures.

Observations on Special Lines—A Tribute to American Packing and Labeling.

BY AN ENGLISHMAN.

IN no direction of dealings with Australasia has the American manufacturer been prompter or more successful than in the Hardware and ironmongery trade. He has hit the English hard. Why? He is able to quote lower prices for his goods. Why, again? He makes the kind of goods which are generally manufactured in large quantities at a time, involving much repetition work; and he understands the matter of packing and labeling the goods. Moreover, he has cheaper shipping facilities. English goods are, it is professed, preferred for their higher quality generally, but their finish is not so attractive to the Australian buyer as the American product.

British Special Trade Commissioner on American Goods.

Ben H. Morgan, who, as special trade commissioner of the Manufacturers' Association of Great Britain, recently spent seven months in that part of the world, is well entitled to speak of business. He writes:

During my visit there were traveling through the country a representative of a United States File manufacturing firm and another of a Saw making house. Both these men were not men merely with a commercial training, but familiar with every process in the manufacture of the goods they were selling. They not only called on the principal buyers and the largest users, but gave lectures before engineering societies and workingmen's clubs, and practically demonstrated the qualities and characteristics of their goods.

I am personally able to judge of a lecture on Files given in Melbourne, and it certainly was extremely interesting and calculated to create an impression in favor of American methods and productions as compared with those of Great Britain. * * * *

I have no doubt whatever that some of the apparent "want of enterprise" of British firms is a reflection of the condition of trade in our home market. In Great Britain to-day one sees year after year an increasing quantity of German and American small tools on the market, and it is possible that this struggle for existence which the trade is undergoing at home has hampered our manufacturers in pushing their business in the colonies.

Introductory Methods.

A reference to protection, though veiled is transparent in the remark, "While the American is able to manufacture these goods in large quantities, having a huge home market to depend upon, the British manufacturer can do little. more than make to order." Mr. Morgan proceeds:

Up to about eight years ago practically the whole of this trade was done with British manufacturers, but here the superiority of American methods in placing goods on the market is shown. Two American firms in particular sent to Australia special representatives with complete samples of Lock sets in entirely new finishes, such as antique copper, oxidized silver, &c. They also brought out a 3½-in. mortise Lock which can be placed on the stile of the door slightly higher than where the Lock was usually placed on the Lock rail. The samples brought out were all fitted up and shown in action. The method adopted by these special representatives was not so much to go to the importers of Locks, but to demonstrate them to architects and builders, and thus create a demand. They then came to the importers and practically forced their hand in ordering the goods. Since that time, in cheap and medium-priced Lock sets they have practically held the market. The British manufacturers have, during the last two years, followed their footsteps in the new style of finishes and Locks and are retaining some of the trade.

Notes on Special Lines of Hardware Sold in the Australasian Market.

Stoves.

Stoves are chiefly of Colonial manufacture, although there are still some British and American imported. Either due to bad packing or irresponsible handling by shipping companies, there is always a larger percentage of breakage in consignments of stoves from Great Britain than from America, and this militates against British trade.

Lawn Mowers.

Down to, say, six years ago, the chief high priced Lawn Mowers were imported from England, also many of the lower priced, although for a long time the Americans have had a good hold of the market in the latter class. Recently the higher priced American Mowers have come into vogue, and to a large extent are ousting the British. A Melbourne house says on this subject:

It is not in this case a question of quality or finish, but simply a matter of pushing the goods. The Americans have several representatives in Australia who know their business, but the British manufacturers are practically not represented.

In England you will see a good many Lawn Mowers of small size, suitable for suburban gardens, labeled "Made in Canada." You can buy these at about $6, and very good workable little things they are. But the ordinary Lawn Mower of respectable size costs anything from $25 to $100 if of British manufacture.

Guns and Cartridges.

The imports of these are divided principally between two British and two American houses. According to an importing house:

In this case the Americans have got their goods on to the market by sheer push. When the British held the market completely the Americans sent out special representatives, who, by their methods of doing business and the attractive way in which their goods were got up, obtained orders and gradually increased their trade.

In 1906 the United States contributed £76,212 worth out of a total of £146,647 of the trade in Sporting Cartridges. Similarly in Sporting Rifles and Shotguns the United States predominates, with a total value of £34,241 out of £63,049, the United Kingdom's share being £20,733, Germany's £7509 and Belgium's £5080. The American trade is chiefly in Rifles and the cheaper sort of Shotguns, while the British trade is in the better class of Guns.

Small Tools.

The bulk of this trade at present is in American hands, and German Tools are also growing in favor. In 1907 the total importations of these goods into Australia amounted to £478,123, of which £228,276 were of American origin, £219,907 of British origin, £22,395 from Germany, £4000 from Canada, and £2000 from France, and the balance from other foreign countries. New Zealand in 1907 imported "Artificers' Tools" to the value of £120,418, and foreign competition is much the same there as in Australia.

Augers.

American manufacturers are rapidly gaining the business in this line. For a time British goods controlled the market, but owing to uncertainties in delivery the trade is going out of their hands.

Axes.

In this field the Americans monopolize the field. The trade is a large one, and American firms supply patterns that are better liked by Australian and New Zealand wood cutters than the British article. In addition to showing special patterns of their own, the Americans have made special ones for the Australian trade. English manufacturers have been asked to copy these, but in most cases have declined.

Anvils.

Though the English article is said to be a better one, the American manufacturers are getting the trade by supplying a more finished Anvil at a lower price. Cheap freights from America have much to do with this.

Adzes, Picks, Braces, Chisels, Drills.

The British firms have the pull here. For some time British firms have been successful in doing a large proportion of the trade in Twist Drills, but latterly American Drills have again been largely imported.

Files.

Two American firms hold the bulk of the Australian trade in Files. British Files may be somewhat better—this is acknowledged—but they are not sold at prices which compete with the machine cut American Files. The conditions under which craftsmen work in Australia do not call for the heavy File, which can be recut from time to time; they ask for a cheaper one that may be thrown away when worn. American representatives work the market direct.

Iron Planes.

These are almost exclusively imported from America. The reason is that the American manufacturer is continually producing something new. Also they are of good quality.

Carpenters' Hammers.

These are freely imported both from England and America, but the American article is cheaper.

Saws.

The Australian artisan prefers the American Saw. He says it is much easier to sharpen than the British; in fact, a common complaint against the British Saw is that it is too hard, and that, when being sharpened by a carpenter and set, the teeth very often break. According to an importing house:

> British manufacturers are now making and showing Saws through their representatives which should compete in every way with the American.

Spades and Forks.

The higher priced goods come from Great Britain and the lower priced from America. In such lines as Hay Forks and long handled Mining Shovels the Americans have seized the market, as they make a much better article at the price than the British.

Galvanized Iron Sheets.

Lower price is again the reason for the inroads American manufacturers have made in this trade. The freightage is in favor of American firms, and the stuff, moreover, is very good.

Cutlery.

Germany is making great headway in Australia, but Great Britain rules the roost. In 1907 Germany sent Cutlery goods to the value of over £23,000, while America's contribution came to over £10,000. The English trade amounted to £131,824, and it is said that business could be increased by prompter deliveries. In the same year New Zealand imported Cutlery to the value of £27,607.

Nails.

The trade in Horseshoe Nails seems to be mainly in the hands of foreign houses. To a total importation of the value of £12,070 in 1907, Great Britain contributed £3129. Germany's share was £2375; the United States, £1480; Belgium, £79; other foreign countries, £5007.

Trade in other Nails of various kinds totaled £73,294, of which the British share was £35,207; the United States contributed to the value of £21,421, and Germany, £15,677. New Zealand purchased Nails in 1907 to the value of £60,166, the conditions of trade being similar to those in Australia.

Wire Netting.

Great Britain holds the lead in this trade, but Germany is running her hard. Out of a total value of £580,680 Germany got in £173,645.

Wire.

The same may be said in regard to Barbed Iron and Steel Wire. Here the business is rapidly being taken out of the hands of British manufacturers. Of the total importations of £728,405 in 1907, Germany contributed no less than £371,599; the United States, £187,412, while the British share amounted to only £157,146. The foreigner—from the English standpoint—has a protected home market, and an important factor is that he can get his goods to market for a much lower freight rate than the Britisher is compelled to pay.

Sewing Machines.

Of a total importation in 1907 of £189,364, Great Britain contributed £12,789, while the share of the United States was £132,578, and Germany £43,798.

Lamps and Lampware.

This trade is rapidly falling into American and German hands. The Americans and Germans pack their Lamps and Lamp Glasses in separate boxes, whereas the Britisher contents himself with wrapping his goods in paper only, as the separate cardboard box method of packing bulks his consignment too much, and the sea carriage on those goods is charged by measurement.

Packing and Labeling.

One last word on packing and labeling goods: The following is a statement by one of the largest Hardware distributing houses in Melbourne:

> American manufacturers, as a rule, are very much better packers than British, using to a very large extent the system of dispensing with straw or other packing material and relying on fixing the goods in the cases by means of wooden cleats, this making them immovable during transit. Goods packed in this way arrive much cleaner and are very quickly made ready for sale. The Americans also, as a rule, pack more goods into the same space than the British. American manufacturers never charge for outside casing—British always do.
>
> * * * * With regard to boxing, wrapping and labeling goods the Americans are far ahead of the British. They use to a very large extent attractive cardboard boxes or cartons, with equally attractive labels in two or three colors on the outside, fully describing the contents. Take, for instance, Electroplated Ware: The usual British custom is to wrap the goods in paper and tie with string. It is easily seen that such articles as Teapots, Entrée Dishes, Cruets, &c., make very irregularly shaped parcels, which are hard to put away on shelves or fixtures where bulk stock is generally stored. It means that very often where an article is required perhaps two or three dozen have to be pulled down. Another disadvantage is that these packages are not air-tight, and the goods, when opened, are very often tarnished.
>
> The Americans first wrap the article in soft paper and then place it in a cardboard box or carton which is so sealed as to be perfectly air-tight. An attractive label is pasted on the outside fully describing what is within. Goods packed in this way are in much better condition on arrival and are, without doubt, much easier to pack away on shelves.
>
> American Stoves are specially packed in skeleton cases, to protect corners and parts liable to breakage. The British manufacturer either sends them without cases of any kind, or, if they are cased, a very stiff price is charged.
>
> As a general rule the American manufacturer is much more open to suggestions for improvement in methods of packing than the British; in fact, to suggest to some of the old-established British manufacturers that their method of packing should be altered will more often than not call forth the rejoinder that they do not consider that their methods can be improved upon.

It should be comforting to American exporters to know that there is a consensus of opinion in their favor. A leading South Australian firm writes:

> American traders have the happy knack of giving their goods an attractive appearance and of putting up their goods conveniently in suitable packages for shelving and retailing—details in which some English houses have been remarkably dilatory in following them.

Everything in this article is encouraging and stimulating to American exporters of Hardware, who have won their success in Australasia by sheer skill and enterprise.

It has been determined to hold the joint conventions of the American Hardware Manufacturers' Association and the Southern Hardware Jobbers' Association, the 18th of the former and the 20th of the latter, at Atlantic City, N. J., June 8, 9 and 10, 1910. The headquarters of both associations will be at the Hotel Traymore, and all applications for reservations should be addressed to Charles O. Marquette, manager. It is suggested that inasmuch as there is no single hotel at Atlantic City that can accommodate all who are in the habit of attending these conventions, those who desire to be taken care of at the headquarters should make reservation as early as possible.

Good versus Cheap Hardware

The Difference and Its Business Effect.

Store Individuality and Character — Quality Goods Advertise the Merchant — Examples of Salesmanship.

A paper by John Hall, Foreign Sales Manager of the Simmons Hardware Co., St. Louis, read before the annual meeting of the Florida Retail Hardware Association.

In the editorial section of a recent issue of *The Iron Age* appeared an article, which concludes as follows: "The Hardware stores of to-day are greatly in advance of those of a few years ago and they are constantly improving. The demand for a better order of things is in the air."

How very true that is and what a fitting prelude to the subject which I am asked to talk about.

I have visited stores and sold Hardware to the merchants of practically every country of the world, to Hardware dealers of all nations.

I have found that there are more Hardware stores than necessary, generally speaking, in every country, every city and every town, and it is possible that condition exists in Florida. I have particularly observed that a very few retail Hardware dealers make money and prosper, and many of them simply exist, getting barely a living as a return for their capital and work.

No condition exists in any line of business without a cause for it, and possibly the reason in this case can be found in the difference between Cheap and Good Hardware, and the difference between good and poor salesmanship, as illustrated in the retail stores where Hardware is kept for sale.

Two Hardwaremen—a Contrast.

I call to mind just now the recollection of the best informed Hardwareman, in my judgment, that the South ever produced. It was some years ago that he went into the Hardware business in a Southern city. He was the best posted man on prices that I have ever known, and in his business he prided himself on buying goods cheaper and buying cheaper goods than any other man in this country. **His business lasted just about two years and he went into bankruptcy. He is now making only a very ordinary living selling Hardware on the road.**

Practically at the same time that this Hardwareman opened his Hardware store another Hardware store was opened in the same town by a man who did not know anything about the business; he was a school teacher—a country school teacher—**but he did know people and human nature.** Boarding around from farmhouse to farmhouse he had learned the wants, the sentiments of that great army of men, those that buy the most of the goods that are sold from the Hardware store—the country people. When he opened his store he employed a very ordinary Hardwareman to do his buying and gave instruction **that particular attention should be paid to the buying of goods of quality, and then he took his stand in the front part of his store, and when the farmers and the mechanics and the other people bought anything he tried to say to them, and did say to them, that he knew that what they had bought would give them satisfaction because it was good.** The only thing that he knew about the business was that the goods in his store were the best that his money could buy. This man is in business to-day. He lives in a beautiful home, his wife and daughters ride in a $6000 automobile. He is reputed worth a half million dollars.

A Name That Stood for Something.

When this man put his name over the front of his store it represented to him, and he intended that it should represent to the people whose trade he solicited, **the sentiment of fair dealing and of complete and entire satisfaction in every transaction,** and no Hardware store can hope to build any continued, permanent success unless that sentiment exists in the heart and brain of every living soul connected with it.

The Public and Store Individuality.

There is a peculiar thing about the public. It seems to demand the individuality of a personal name around which to crystallize its confidence. I have noticed that the Hardware stores where the business has been properly conducted under the name of John Smith or the Smith Hardware Company will meet with a greater measure of success than the business conducted under a negative name like that of the St. Louis Hardware Company or the Missouri Hardware. That thought is worth analyzing, and I believe if you will think it out carefully you will find the explanation in the public assuming a personal guarantee when a personal name is on the signboard over the store.

Reputation.

Queer thing, this reputation. We all know how easy it is to lose a good one, how easy it is to live up to a bad one. Any schoolboy can write an essay on the subject, but this store reputation, this store character, what about it? How much thought do we give it, how many of us here to-day properly estimate its importance?

Store Character

is just as tangible as personal character, and it does not take the public long to get the correct measure of either. Can anything be more gratifying than to know that the general impression in the community where you live, that as a result of the power to resist the temptation to sell cheap things, the name of the store which you own stands for the best, because you have built on a foundation of quality, the good will of your business is reckoned as an asset at the bank when you want to borrow money?

Store character is made up largely by the class of merchandise sold in the store. Do not understand that I underestimate the personality of the clerks and proprietor; as the boss is, so will the clerk be; the quality of the stock and the way it is displayed is a card index of the inner workings of the proprietor's mind. **It is a law of human nature that we measure the public by our own standards, and a man who has a cheap mind will employ cheap clerks and may buy cheap goods, and be firmly convinced that he has properly estimated the buying public of his section.**

Merchant versus StoreKeeper.

Such a man is not a merchant; he is a storekeeper. He argues that the trade will not pay the prices of the things that are good. He has no conception of that unchangeable law that we can only want what we have seen or heard about; there can be no desire to possess the things of which we are ignorant.

The buying public of any community is exactly what the merchant makes it. If the grocery merchant talks 25-cent tea, 30-cent coffee, 10-cent brooms, 22 lb. of sugar for $1, and the Hardware store puts its selling force behind 10-cent Elbows, 25-cent Pocket Knives, 10-cent Screwdrivers, 10-cent Screwdriver Bits, and such trash, how can the people be expected to ask for anything else?

The continued buying and selling of things that are cheap not only prostitutes the mind of the business man and his clerks, but warps the idea of the community in which the business is carried on.

A Pitiable Spectacle.

A Hardware dealer recently told me that he was forced to push the cheapest goods he could buy to meet the competition of the two racket stores in his town. He was trying to do something in the doing of which no man has ever yet been successful—"beating another at the other's own game." Just think of the pitiable spectacle of a Hardware store being forced to the defensive

in a fight with a racket store. This dealer told me business was "rotten." **Can you wonder at it, when he was busy fighting on the defensive against 10 cent wash basins?**

He pointed to his Wire Cloth and said that he had not sold 25 per cent. of what he bought, though he was offering it at a less price than anybody else in town. I picked up a roll and gently tapped it on the floor and quite a lot of paint dropped off. I called his attention to the poor quality and he explained: "I bought it at 7 cents per 100 sq. ft. under the regular price," and that, as he put it, was "going some." Another merchant in that town told me that he had practically sold out on Wire Cloth. He made it a rule to buy the best. Which do you think of these two dealers was "going best?"

Experiment in Pocket Knives.

Last year I spent two weeks behind the Pocket Knife show case in a large retail store. The first week the average price of Pocket Knives sold was 62 cents each; the second week it was $1.02. This difference was caused by teaching the clerks to put out on the show case Knives at $3, $2.50, $2, $1.75, $1.50 and $1, and give every customer that came in to buy, no matter what price Knife he asked for, a chance to see the best goods.

Two Windows of Enameled Ware.

A most interesting experiment which I recently saw tried in an important town in the Middle West. A Hardware store doing a very good business has two beautiful show windows. The one was filled with cheap seconds in Enameled Ware, and the goods were marked at prices that seemed to be lower than I had ever seen or known Enameled Ware to be sold for before. For instance, I saw Dishpans marked at 10 cents each in this window. I know these Dishpans cost more than that.

In the other window he had, piece for piece, variety for variety, filled with a line of beautiful Enameled Ware, striking in colors and exquisite in finish, marked at prices that afforded him a very large profit. An equal amount of advertising was given to both these lines, not together, but in separate parts of the newspapers of the town. **At the end of the week the result was figured, and much to the astonishment of every one the net results were 100 per cent. in favor of the high priced goods.**

Drawing Knives at 50 Cents Each.

A large Hardware store in which I am very much interested—not financially—in one of the large cities in the West, has been conducting a series of special sales, and on two occasions they have had on their bargain table Drawing Knives at 50 cents each. A few days ago I met a carpenter in a small town near to where this Hardware store does business, and in conversation with him it came out that he had bought one of those Drawing Knives. He went to his tool kit and got the Knife and showed it to me. I offered to buy it from him, because I wanted to keep it as a specimen of the result of selling cheap things by a first-class Hardware store. This carpenter said that I could have it. **He told me that he would be glad to get it out of his sight, as the thing made him mad every time he looked at it, and he did not think that he would want to trade at the store where he bought it, again.**

A Feather (?) Duster.

A lady showed me a Feather Duster that she recently bought from a Hardware dealer here in the South. There was a lot of wood where the feathers ought to be—86 feathers to the count. The merchant bought these Dusters cheap, **but the price he pays is this womans' trade.**

Do I Believe in Cheap Goods?

Yes, very sure, and so must you if you would reach the full measure of success to which you are entitled. Every retail stock should be properly balanced, each line where possible should contain a few cheap goods, some medium priced goods and the large portion goods that you can have faith in, recommend and take pride and pleasure in selling.

A Good Tool Counts.

The responsibility rests with you not to sell a mechanic a poor tool; he must work with it for hours, days, weeks, months, years, and the years perhaps lengthen to a lifetime. The doing of good work because of the good tool becomes an element of pleasure in his life, and he not only praises the tool to his fellow artisans, but speaks well of and recommends the store where he got it.

You Are Not in Business for a Day.

With most of us the store represents our life's work. No matter how large the profit on a cheap, poor piece of goods, you sell it at a loss, for the customer seldom wants another piece like it again. It is the cumulative value of satisfaction when put into use that keeps the continued stream of business flowing toward your store. If you make profit to-day and lose the customer to-morrow, if you make money this year on a line of goods cheaply bought because of inferior quality, you will hardly make money the next year on that line of goods from the same customers. It was Abraham Lincoln who said: "You can fool some of the people some of the time, but you cannot fool all of the people all of the time."

Modern Salesmanship

for the retail Hardware store is but the putting into practice old time common sense, summed up in the Golden Rule: "As you would that other men should do to you, so you do unto them." The selling of cheap Hardware resolves itself into a question of price, and you are always on the defensive to prove that you are the lowest. Figuratively speaking, you have to drag your trade in. Let your store get the reputation of selling the best, and the people seek you.

Buying a Marble Develops a Problem.

The Good Book tells us that out of the mouths of little children come words of wisdom. My memory goes back into the years that have gone and I recall a picture of a little boy sitting on the front steps waiting for me to come home, and when he saw me he exclaimed: "I have been waiting for you. Won't you go with me to buy a marble?" In the large cities there are stores that, practically speaking, depend upon the patronage of little children for their existence. There are several such stores in the neighborhood of where I live. They keep marbles, kites, spinning tops, toys and such things. Taking this little boy by the hand, we walked up the street and went on by one of these stores; turning a corner, we passed another; soon we came to a third and there my little companion said, "This is it—this is the store," and we went in and he bought his marble, which certainly was a pretty one, and we went back home.

At the dinner table I was asked: "Anything wrong at the office?" "No." "Then why are you so quiet?" I could not give a satisfactory answer, because my mind was busy with a new problem in this game of business. **I was trying to figure out why a little child should pass two stores that had lots of marbles in the show windows and go into a third store to buy a marble he wanted.** If I could solve that problem perhaps it would show the way to cause the carpenter who wanted a Hatchet, the man who wanted a Pocket Knife or the woman who wanted a Carpet Sweeper to pass all the other Hardware stores and come to your store or to my store and buy what they wanted.

The Reason.

That night when the little boy was ready for bed and had climbed into my lap to say "Good night" I put the question to him straight: "Why did you pass Mr. Smith's store and Mr. Brown's store and go into Mr. Jones' store to buy your marble?" **"Why, papa," he said, with evident surprise that I should even ask such a question, "don't you know Mr. Jones always keeps the best marbles?"** You may not like my story, but I commend it to you as worthy of your careful thought, for in it is contained the fundamental principle on which can be built the success or failure of the modern retail Hardware store.

Let me say in conclusion, learn the difference between cheap and good Hardware and the relative value as fac-

tors in the success of your business from the people who come into your store to trade.

Watch the customer carefully examine the several Pocket Knives you put out on the case for his inspection, note his selection of a particular one.

Watch the carpenter balance the Hand Saw and sight both down the back and down the teeth, and then see him decide on a particular one. See this carpenter pick one from the several Hatchets or Hammers you put out for him to look at.

Why do these people do these things? Why do you and I, our wives, our daughters, our sons, do these things whenever we go out to buy what we want? You do not need a man to come here from St. Louis to answer that question. Surely, you know the divine inspiration planted in the heart of every red-blooded human being, no matter of what nation, of what color, causes them to want the best and want it good, not poor, not cheap and not shoddy.

And when your customer has paid his money and leaves you store with what he has bought, I suggest you have in mind that great truth first put into words by the founder of our business: "The recollection of quality remains long after the price is forgotten."

No Monday Claims.

A Wholesale Hardware House Finds It Necessary to Adopt a New Rule in the Case of One of Its Customers.

THE claim department of a Hardware house had long been troubled with demands for refunds from an otherwise good customer, who had been buying frequently, but about once a week he complained by mail about something. The house looked into his claims and settled them promptly. He always received the benefit of the doubt, for it is the firm's policy to keep customers happy. But there were more claims, proportionately, from this man than from others.

One of the vice-presidents, a sort of general utility man, who concerned himself with no particular department, but whose activities touched all of them—heard about this chronic kicker and claimer of refunds. So he wrote confidentially to a friend in the customer's city for a detailed report, as to business standing and personal characteristics. The report revealed a man of honor, probity and wealth, fat bank account and good family. He was respected and liked. But he had one weakness, every Saturday night he was accustomed to get intoxicated in a gentlemanly way.

The vice-president read the report, and sent for the file of letters of complaint. He did not read them, but looked at the dates and compared with the calendar. Every one was dated Monday morning, and the dating stamp marked the hour showed that each must have been carried by an early train on that day. The vice-president smiled, dictated a letter, saying it was the practice of the house to treat their customers with every consideration, and that they particularly desired to show their most distinguished esteem "to him who had been an old and valued client," but that they were going to do a unique thing in his case. From that day no attention would be paid to claims received from him if made on Monday. Any claim, however, that he might send in on Friday would be paid immediately and without question. The house had no more complaints from the merchant, and he is a bigger customer than ever.

THE SENECA RAZOR & MFG. COMPANY of Geneva, N. Y., has recently organized under the laws of New York State with a capital of $10,000, for the purpose of manufacturing and selling high-grade Razors. It intends to employ only skilled German workmen. The company will in the near future have the plant fully equipped with modern machinery and be in position to meet the requirements of the trade.

Goods Returned.

Conversation in a Village Hardware Store.

CUSTOMER (handing salesman a pair of Hair Clippers).—Here! I have brought these back; they are no good and I want to change them.

SALESMAN (looking the Clippers over).—What did you say was the matter with them?

CUSTOMER.—They won't cut hair on the fetlock; they are no good and I want them changed.

PROPRIETOR (stepping up and examining the Clippers.)—You say they are no good, won't cut hair on the fetlock?

CUSTOMER.—Yes, they are no good and I want them changed; I want a short handled pair.

PROPRIETOR.—You live in town?

CUSTOMER.—Yes, I live here.

PROPRIETOR.—If I gave you another pair of Clippers in exchange for these, what could I do with the ones returned?

CUSTOMER.—Well, these are warranted, aren't they?

PROPRIETOR.—Yes, the maker guarantees to send them from the factory in perfect condition. If you will write your name and address on this card and say the Clippers are no good I will send them to the factory and see if the maker can find any defect in them. I would not be willing to put them in stock and sell them to some one else if they are not perfect.

CUSTOMER.—Oh! I'd rather not do that.

PROPRIETOR.—Well, they're not really as bad as you made them out to be?

CUSTOMER.—They aren't as handy as I should like them.

PROPRIETOR.—Now if you had come in here and said you would like to have the Clippers exchanged for a short handled pair I would have thought you more of a man. But you come in and talk loud enough so every one in the store can hear you condemning the Clippers as being no good. If you are willing to put it down in black and white that the Clippers are imperfect and the makers can find any imperfections in them, they will probably be willing to send you a perfect pair.

CUSTOMER.—Oh! I'd rather not say that.

PROPRIETOR.—Well, if there is nothing wrong with these, I certainly shall not change them for a short handled pair. You see if I were to change good goods that way for every one who was not quite satisfied with the style or size I would soon have a lot of second-hand goods that no one would want and which would be a dead loss to me.

Simmons Advertising Service.

THE Simmons Hardware Company, St. Louis, Mo., is sending out illustrated matter fully describing its Simmons advertising service, the object of which is to help the Hardware merchant to make his advertising expenditure produce the best possible returns. To accomplish this the company is prepared to furnish printed matter for distribution to customers, including booklets, post cards, &c.; street car cards, where a merchant is running space in his local cars; window display outfits with complete information for exhibiting fishing tackle, sporting goods, safety razors, enameled ware, &c.; and inside store helps, including display easels, catalogue stands, twine holders, price tags, show case mats, calendars, cloth signs, posters and hangers. The company is also ready to assist the Hardwareman in attracting mail orders by supplying him with letters, circulars, booklets, folders, &c.

THE MACCOY SALES COMPANY, 157 Chambers street, New York, is the name of a recently organized house which has just been appointed selling representative of the Lakeside Forge & Wrench Company, Springfield, Mass., successor to the Springfield Drop Forge Company. The Lakeside Company is manufacturing complete lines of Engineers' and Machinists' Wrenches and Drop Forgings in general.

Although men are accused of not knowing their own weakness, yet perhaps as few know their own strength. —*Swift.*

Reward for Work Done.

People say that in these days of competition one never knows what result will attach to one's work—whether it will bring in a reward or not. Even that, they say, is a chance—a matter of speculation.

Well, one can never utterly eliminate the accidental out of life, but the worker who works his best may be certain of this, that even if his work does not receive his reward—and it really does not fail of it very often—still he has gained one certain thing. He has gained by the very exercise of his skill power which is bound to bring him reward in the future.

Work rightly done brings profit in the development of one's self apart from the profit on which some people only fix their eyes.—*John Bright.*

Against the Current—or With It?

Let any man, however great and gifted, say to himself, "The world is my natural enemy; all men's hands are lifted against me; I have no faith in friendship, or love, or human kindness; but I am ambitious, and I will succeed." Let that man toil as he may, his progress toward success will be retarded because he swims against the natural current of the universe.

He who smiles and says, "The world is what we make it; friendship exists for those who deserve it, and love begets love," that man floats with the current, and all things assist him to his goal, however distant it may be.—*Ella Wheeler Wilcox.*

The Wealth Producer.

It is the nature of man, as distinguished from the beast, that he can by conscious effort better his standing in the material world. Characteristically a man is a worker, a creator of values, a world-maker.

He alone, of all living things, can conceive designs and execute them, can imagine conditions that do not exist and then by patience bring them to pass.

To take the world wholly as one finds it and leave it so is brutal. A man is a man only because he is a wealth producer, an enricher of existence.—*Charles Ferguson.*

Turning Discomfort to Account.

A good way to rid one's self of a sense of discomfort is to do something. That uneasy, dissatisfied feeling is actual force vibrating out of order; it may be turned to practical account by giving proper expression to its creative character.—*William Morris.*

Pointers for the Salesman.

A salesman who is ambitious to rise above his fellows must be a student of human nature.

The personality of a salesman wins or loses him as many orders as the quality or prices of his goods.

A salesman who is wise enough to make friends with his colleagues never wants for a booster.

A good time to tackle an obstreperous buyer on a big deal is right after lunch.

A salesman who has the initiative to beat out a new path in the field of salesmanship is the man who will be the manager later.

Enthusiasm is a superb quality of mind and should be cultivated by an ambitious salesman.

There is a sentiment in business, and the salesman who realizes this fact in impressing himself upon the buyer will always have an advantage over any competitor who does not.

A salesman who knocks his own company to any one except his own manager is making a grave mistake. If you have any complaints place them before your superior officer at a proper place and time.

Don't be too ambitious to become the successor to your boss. The chances are he is holding his job strictly on his merits, and you may be doing the same thing by reason of his graciousness.

If you are permitted to participate in the social life of the customer, don't overdo it.

A salesman always makes more money for the house when he makes the buyer agree with him rather than when the reverse is the case.

A salesman should never show on the surface that his case is lost before the battle begins.

The sun must always shine for the successful salesman, no matter how inclement the weather is outside.

A salesman who can hold and make customers on his own worth as a gentleman and congenial companion makes the most money for the house.

Never indulge in racy stories or obscene talk if you wish to win the respect of the trade at large.

Treat every one courteously in each place that you try to secure business, but never try to make a hit with any one except the buyer.

A salesman must adapt himself readily to his environment and, whether good or bad, must make good.

A cheerful disposition will win the buyer, with less knowledge of the article you are selling, quicker than a thorough understanding of the article to be sold and a crabbed personality.

A salesman is looked upon as a rule, when on the road, as a sport. We know positively that this is not true, but it behooves you to counteract this prejudice by correct demeanor both in business and social intercourse. —*Wm. C. Collins, sales manager, Keystone Steel & Wire Company.*

Barnes & Miller Hardware Company's Loose Leaf Catalogue.

THE Barnes & Miller Hardware Company, 429-435 South Front street, Memphis, Tenn., doing an exclusive wholesale business, has issued loose leaf catalogue No. 5, profusely illustrated, containing over 800 pages. The catalogue is arranged in departments, as follows: Mechanics', Blacksmiths' and Lumbermen's Tools and Supplies; Agricultural Tools and Implements; Heavy Hardware; Builders' Hardware; Saddles, Harness, Saddlery Hardware and Harness Goods; Stoves, House Furnishings and Miscellaneous Hardware; Cutlery, Guns, Fishing Tackle, Sporting Goods, &c. The alphabetically arranged index occupies 23 pages.

In compiling the catalogue the endeavor has been to lessen the labor of ordering of goods, thereby minimiz-

ing the chances of error. Sizes, numbers and weights are given, with list prices and illustrations; also three blank columns, in which retailers may insert prices. The catalogue will be kept up from time to time by sending revised pages to customers.

Wagner Quick-Folding Go-Carts.

The E. R. Wagner Mfg. Company, North Milwaukee, Wis., is offering models of go-carts for 1910 possessing some new features. The latest patterns are more roomy, have additional springs and are more attractive in appearance. There are four models in the line this year, thus giving a wider range of prices.

The Reading Hardware Company's Lawn Mowers.

The Reading Hardware Company, Reading, Pa., has enlarged its line of lawn mowers by the addition of two five-blade machines, making 15 styles in five different sizes, including three, four, five and six blade machines. Careful attention has been given to grading the machines as to price and quality; also to ornamentation and to produce a harmonious blending of the most serviceable colors.

Razor Strops.

L. B. Wasserstrom, 23 Ferry street, New York, manufactures razor strops for the wholesale trade in a total of about 300 numbers, styles and sizes, ranging in price from $10 to $110 per gross. They are made in various leathers, including cowhide, shell horsehide and regular horsehide. A feature of the strops, which include combination and swing styles, with and without canvass, is the use of a special preparation which insures, it is asserted, a soft finish which will not harden. There are various styles of handles, plain and otherwise, and they are fitted with fancy trimmings in steel, polished and nickeled.

Hand Bellows.

C. H. Keese, 8 Peck slip, New York, is making a specialty of small hand bellows, having for many years manufactured the larger bellows for blacksmiths, the sale of which, however, has been curtailed by the introduction of metal hand and power rotary blowers. The hand bellows are especially serviceable for molders in foundries, electricians for cleaning out dynamos, printers, confectioners and other workmen for reaching and cleaning surfaces not otherwise easily reached. Hand bellows are made in 8, 9, 10, 12, 14 and 16 in. sizes, the two latter of sufficient capacity for dynamo work and range in price from $14 per dozen to $6 each.

The Moore Push-less Hangers.

The Moore Push-Pin Company, 125 South Eleventh street, Philadelphia, Pa., is offering the new hanger shown herewith, nearly full size. The hook is highly lacquered brass, with loose tool tempered steel points, or brads, which can be driven into walls with a few taps of a hammer. The point is easily withdrawn, leaving only a tiny round hole that is almost invisible. In rooms and on stairways where there is no picture molding these hangers can be used instead of picture nails, and the picture wire may be made short enough so that it will not show above the frame. It is said that the hangers will support 20 lb. in wood or in plaster walls. The hooks are recommended by the company for use in the home, office, factory, &c., for pictures, mirrors, racks, kitchen utensils, towels, curtains, clothing, telephone books, thermometers, nick-nacks, &c. The hangers are put up in boxes containing six hangers, marked to retail at 10 cents. One dozen boxes are attached to an easel card in colors illustrating the use of the hangers and also displaying a real hanger in such a way that it appears to be holding up a picture frame.

The Moore Push-less Hanger, Designed to Support 20 Lb. in Wood or in Plaster Walls Without Marring Them.

The Griffin Adjustable Sink Bracket.

The Griffin Mfg. Company, Erie, Pa., is putting on the market the adjustable sink bracket shown herewith. The adjustability permits the bracket to be attached without cutting or blocking out to make the bracket stand level. Being open in the back makes it convenient to straddle drain pipe or other obstruction whenever necessary. The folding feature of the brace allows the brackets to be carried in store shelving in comparatively small space. The brackets are 14 x 14 in. in size, and are slotted to take all sizes of sinks up to and including 20 in. wide. They are also provided with screw holes, and can be used as shelf brackets. The finish is hard jet black enamel burned on, and they are packed 1 dozen pairs in a box.

The Griffin Adjustable Sink Bracket, 14 x 14 In. in Size, Slotted to Take All Sizes of Sinks Up to and Including 20 In. Wide.

The R. & P. Co. Bolt and Pipe Wrenches.

Rogers, Printz & Co., Warren, Pa., is offering the bolt and pipe wrenches shown herewith. The wrench consists of three parts, which are referred to as powerful and unbreakable. The main handle bar is made from specially tempered drop forged steel in the form of an I-beam, which, it is stated, gives unusual strength and is the best grip for the hand. The shank or lower jaw is also drop forged steel of the same quality and temper. The yoke or sleeve is cold drawn from specially made

The R. & P. Co. Bolt and Pipe Wrenches.

and finest quality seamless steel tubing. The company states that the tempered steel jaws will turn the sharpest file. The wrench can be instantly adjusted to any size of bolt or pipe by simply moving the yoke forward with the thumb, while the release is just as quickly effected, the operation being accomplished with one hand, even with glove or mitten on. The company guarantees an 8-in. wrench to twist the head off a steel bolt ½ in. in diameter without in the least affecting or straining the wrench or the jaw slipping. A special size 6-in. wrench is also made, ¼ in. in thickness, especially adapted for thin nuts in awkward places on automobiles, carriages, or wherever a thin wrench is required. It has flat jaws, I-beam handle grip and is a drop forged steel tool, as in the larger sizes.

The Walpole Fiber Shipping Case.

The accompanying illustration represents a shipping case offered by F. W. Bird & Son, East Walpole, Mass. This is made of one piece of strong fiber board, the thickness of which is proportionate to size of the case and the service required. The two ends of the fiber are securely riveted together and the fiber is creased to permit

The Walpole Fiber Case, for Use in Shipping Goods.

folding into box shape. The cases are shipped in flat bundles, ready to be set up by hand. The cases are easily set up and sealed with gummed strips, as shown, the strips being furnished with the cases, cut to the required size. The point is made that the gummed strips securely seal the case so that there is no chance for "concealed losses." It is possible for wooden shipping cases to be pried open in transit, some of the contents taken out and then nailed up again so that they are apparently in good condition at transfer points or when reaching destination. It is claimed for the fiber case that abstracting goods from it and restoring the case to its original condition is impossible. The cases meet all the requirements and specifications of the Southern and Western Official Classifications, it is stated, and, under the rulings, the cases are accepted by the railroads without any increase in tariff over ordinary wooden cases. It is explained that compared with the ordinary wooden case the fiber case saves 10 to 40 per cent. in initial cost, 30 to 60 per cent. in weight of case and 50 to 80 per cent. in storage space.

Ashby's Improved Wire Cloth Rack.

The wire cloth rack, shown in the accompanying illustrations, is made by the Edge-Ashby Hardware Company, Hanson, Ky. The rack holds seven rolls of wire cloth, from 24 to 36 in., and is 30 in. high, 38 in. wide and 26 in. deep. It is made of clear poplar, painted red, car-

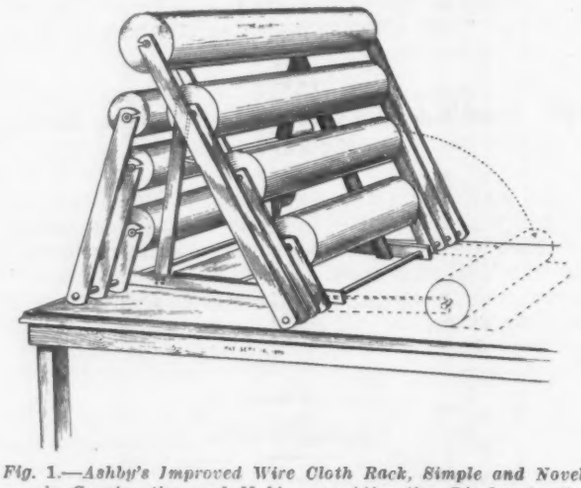


Fig. 1.—Ashby's Improved Wire Cloth Rack, Simple and Novel in Construction and Making an Attractive Display in the Store.

riage paint being used to give a bright and glossy finish. The weight when crated is about 50 lb. Rolls of cloth are held in place by rods, which are fastened by the device shown in detail in Fig. 2. The point is made that the rack can be used with perfect satisfaction in connection with any and all brands of wire cloth. This is made possible because of the suitable sized bungs furnished with the racks, which can be substituted for those placed in the rolls of cloth at the factory, if the latter are too small. When filling the rack it is not necessary to rewind the cloth or to hold the roll while it is being fastened in place, as the arms are folded to the counter, as shown by the dotted lines in Fig. 1, and the outside rod nuts are loosened. Then the rod is removed and passed through the roll of cloth and replaced in the slots, where it it held by tightening the nuts. The arms are folded to the counter either to fill or to unroll the cloth when making sales. The counter affords a

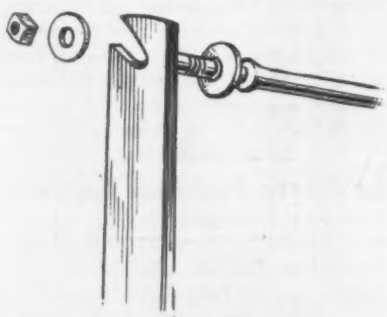


Fig. 2.—Detail View of Device for Securing Rods in Place.

smooth surface for unwinding and cutting off the cloth. When only a short piece of cloth is needed it is sometimes easier, it is explained, to unwind the cloth without folding the roll to the counter. The point is emphasized that the rack makes an attractive display, because of its form and the novel arrangement of the wire cloth. The rack is designed so that the weight of the rolls of cloth prevent unwinding when in use or on display. No cranks, spring or catches are used in the construction of the rack. This rack was originally designed only for use in the company's store and not intended for sale, but as it proved so satisfactory last summer it was decided to have it patented and put on the market.

Clark's Emergency Exit Door Lock.

Hugh Elmer Clark & Brothers, Rochester, N. Y., are offering the emergency exit lock shown in the accompanying illustrations. The locks are made for single and double doors swinging out in public buildings,

Fig. 1.—Inside View of Clark's Emergency Exit Door Lock Designed for Double Entrance, Swinging Out, with No Astragal or Rabbet and Where Entrance Is Not Necessary.—Pulls Can Be Put on the Outside of Each Door.

churches, schools, &c., in the standard finishes, in brass and iron. For single doors the locks are made where entrance key is necessary and where key is not necessary. For double doors locks include those having astragal on outside, where entrance key is necessary; with no astragal or rabbet, where key is necessary; with astragal on outside, exit only necessary, &c. The lock has in its crossbar a patented feature, which, it is said, is of vital importance in an emergency exit device. In use there is no upward or downward movement of the cross push bars, but are so arranged that the slightest pressure against the cross bar releases the doors, so that persons pushing, falling or jostling against the bar will release the doors and cause them to swing outward to the fullest extent. By pressure against the bar the top and bottom dead bolts are drawn and automatically locked in that position, leaving the doors free to swing. In designing and making the lock it is remarked by the manufacturers that care has been exercised to secure a good proportion of parts to withstand strain, to use a high grade of material and to give the trim an effective appearance. Nuts and small screws which might easily become loosened are eliminated by the use of steel pins locked in place by spring cotters. The lever arrangement is said to be such as will give the best results. The makers emphasize the simplicity of construction, strength and durability of the lock.

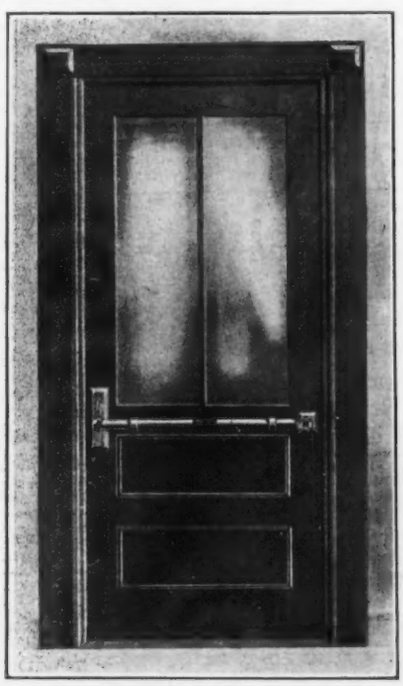
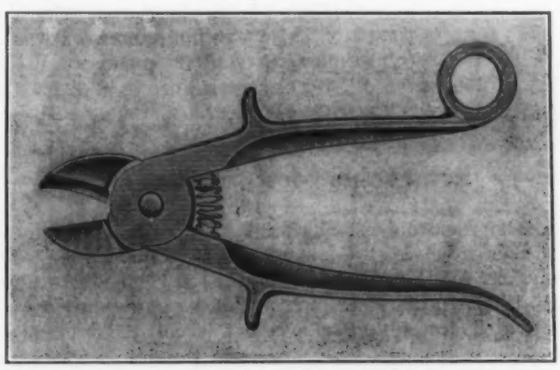


Fig. 2.—Inside View of Emergency Exit Door Lock Designed for Single Entrance Doors, Swinging Out, Where Entrance by Key Is Necessary.—On the Outside the Latch Bolt Is Operated by a Cylinder Key and Thumb Latch.

The Practical Orange Clipper.

The Cassady-Fairbank Mfg. Company, 6106-6130 La Salle street, Chicago, Ill., is offering the Practical orange clipper, which is 6½ in. long. The jaws open ¾ in. and the handles 4½ in., and the clipper weighs 8 oz. The blade is made of fine surgical tool steel, slightly beveled



The Practical Orange Clipper for Clipping Oranges and Lemons. Also Used as Pruning Shears for Trimming Vines, Small Trees, &c.

on the outside edge to cut stems close without injuring the fruit. The curved, blunt points prevent punctures. The spiral springs are of best piano wire. The handles are steel castings, aluminum finished. The clipper may also be used for trimming small trees, branches, grape and other vines, &c., as thick as a lead pencil. The clippers are packed 1 doz. in a box, weighing 6 lb.

Parkinson's Evercool Cover Lifters.

H. C. Parkinson, 2480 Shattuck avenue, Berkeley, Cal., is putting on the market the Evercool cover lifter for lifting covers from pots and pans without burning the fingers. The point is made that the spun knob on cooking utensil covers has the disadvantage of becoming so hot from the steam that collects inside of it that it necessitates a cloth in the hand of the person taking hold of it to prevent getting burned. The lifter is to supplement the spun knob. The knob proper, shown in the illustration between the thumb and first finger of the hand, is made of wood or any nonconducting material suitable, and is secured to a circular spring by a rivet on the under side of the knob. The spring reaches down on each side of the spun knob on the cover and is held in place by two prongs on each of the lower ends, these embracing the reduced portion, or neck, of the spun knob and hold it securely.

Parkinson's Evercool Cover Lifter to Go Over Spun Knob on Covers for Pots and Pans.

Reynolds' Ball Joint Pudding Stirrer.

The stirrer here shown, suitable for use in puddings, cereals, mush, &c., to prevent sticking, is offered by the Cassaday-Fairbank Mfg. Company, 6106-6130 La Salle street, Chicago, Ill. The device has a long handle to protect the fingers where frequent stirring from the bottom is required, and the ball joint enables the disk to reach every part and attain even a horizontal position. The bottom view of the concave disk, Fig. 2, shows the V-shaped construction and the ball socket. The disk is 1⅞ in. in diameter. The slats spring slightly, bringing the edges in contact with all internal surfaces. The overall length is 12 in., with nickel plated ferrule, rod, ball and disk. The goods are packed one dozen in a box, weighing 27 lb. per gross. The company also manufactures a kettle scraper of similar construction, but 7½ in. long over all, for scraping burned and dried on material, weighing 21 lb. per gross.

Fig. 1.—Reynolds' Ball Joint Pudding Stirrer.—Bhe Ball Joint Allows the Disk to Reach Every Part and Attain Even a Horizontal Position.

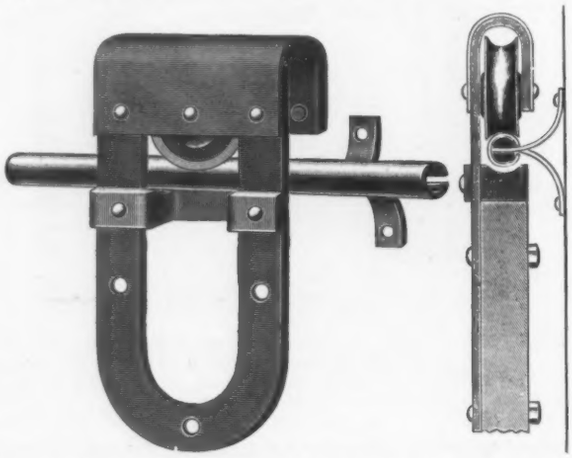
Fig. 2.—Bottom View of Disk of Pudding Stirrer, Showing V-Shaped Disk Construction and Ball Socket.

Removable Steel Clothes Posts.

The removable steel clothes posts, made by the Milwaukee Steel Post Company, 77 Wisconsin street, Milwaukee, Wis., are of special high carbon steel tubing, 1 5-16 in. in diameter, and not 15-16 in. as stated in illustrated description in a recent issue. They stand 6½ ft. above ground. The posts are stood in sockets separate from the posts. The sockets are 2½ ft. long, and are driven until they are level with the top of the ground, where they remain permanently. Posts can be inserted in the sockets and lifted out again, leaving the lawn free from obstruction. A steel hook attached to each post is automatically adjusted by tightening the clothes line at any hight desired.

Lane's Tubular Barn Door Hanger and Rail.

The accompanying illustrations represent a tubular barn door hanger and rail, put on the market by the Lane Brothers Company, Poughkeepsie, N. Y. The hanger has a steel frame of the company's U-shape design, strongly braced and covered. The wheels are fitted with roller bearings, while the steel tubular track has double braced steel brackets rigidly attached. The company emphasizes the fact that the hanger cannot jump the track, and that it allows the door to swing outward a considerable distance without cramping either track or hanger.



Lane's Tubular Barn Door Hanger and Track with Ball Bearing Wheels and Double Braced Steel Rail.

PAINTS, OILS AND COLORS

	℔ gal. bbl.	lots
Animal, Fish and Vegetable Oils—		
Linseed, Western, Raw	.62	@63
State, Raw	.62	@63
City Raw	.63	@64
Boiled, 1¢ ℔ gal. advance on Raw.		
Raw, Calcutta, in bbls	.75	@..
Lard, Prime Winter	1.02	@1.08
Extra No. 1	.59	@60
No. 1	.50	@52
Cotton-seed, Crude, f.o.b. mill.	5¾	@ 5¾
Summer, Yellow, prime	6.70	@6.80
Summer, White	7¼	@ 7¾
Yellow, Winter	7¼	@ 7¾
Tallow Oil, Acidless	.57	@58
Menhaden, Brown, Strained	.30	@31
Northern, Crude		@..
Southern	.24	@..
Light Strained	.30	@31
Bleached Winter	.32	@..
Extra Bleached Winter	.34	@..
Cocoanut, Ceylon ℔ lb	8	@..
Cochin ℔ lb	9	@..
Cod, Domestic, Prime	.38	@..
Newfoundland	.40	@42
Red Elaine	.48	@51
Saponified ℔ lb	6	@ 7¼
Olive, Yellow	1.30	@..
Neatsfoot, Prime	.58	@62
Palm, Lagos ℔ lb	6¼	@..
Mineral Oils—		
Black, 29 gravity, 25@30 cold test	12½	@13
29 gravity, 15 cold test	.13	@13½
Summer	.12	@12½
Cylinder, light filtered	.20	@20½
Dark, filtered	17½	@18
Paraffine, 903-907 sp. gravity	.14	@14½
903 sp. gravity	.13	@13½
883 sp. gravity	10½	@11
Red	.13	@13½
Miscellaneous—		
Barytes:		
White, Foreign ℔ ton	$18.50	@20.50
Amer., floated ℔ ton	17.00	@18.00
Off color ℔ ton	12.50	@15.00
Chalk in bulk ℔ ton	3.00	@ 3.40
China Clay, Imported ℔ ton	11.50	@18.00
Cobalt, Oxide ℔ 100 lb	1.45	@ 2.60
Whiting, Commercial ℔ 100 lb	45	@50
Gilders ℔ 100 lb	.52	@ .64
Ex. Gilders ℔ 100 lb	.56	@ .68
Putty, Commercial— ℔ 100 lb		
In bladders	$1.70	@2.00
In bbls. or tubs, 100 lb	1.20	@1.45
In 1 lb to 5 lb tins	2.65	@3.25
In 12½ to 50 lb tins	1.50	@1.90
Spirits Turpentine— ℔ gal.		
In Oil bbls	.61	@61½
In Machine bbls	.61½	@62
Glue—	℔ lb	
Cabinet	.12	@15
Common Bone	7½	@ 9
Extra White	.18	@24
Fish, liquid, 50 gal. bbls., per gallon	.60	@1.20
Foot Stock, White	.12	@14
Foot Stock, Brown	9	@11
German Common Hide	.10	@12
German Hide	.12	@18
French	.10	@40
Irish	.13	@16
Low Grade	.10	@12
Medium White	.14	@19
Gum Shellac—	℔ lb	
Bleached, Commercial	.16	@17
Bone Dry	.20	@21
Button	.29	@30
Diamond I	.24	@25
Fine Orange	.18	@20
A. C. Garnet	.16	@17
Light Orange	.17	@19
Kala Button	.13	@15
D. C	23½	@24
Octagon B	.20	@22
T. N	14½	@16
V. S. O	21½	@22
Colors in Oil—	℔ lb	
Black, Lampblack	.12	@14
Blue, Chinese	.36	@46
Blue, Prussian	.32	@36
Blue, Ultramarine	.13	@16
Brown, Vandyke	.11	@14
Green, Chrome	.12	@16
Green, Paris		@24
Sienna, Raw	.12	@15
Sienna, Burnt	.12	@15
Umber, Raw	.11	@14
Umber, Burnt	.11	@14
White and Red Lead, &c.—	℔ lb	
Lead, English White, in Oil	9½	@ 9¾
Lead, American White:		
Dry and in Oil, 100, 250 and 500 lb kegs		6¾
Dry and in Oil, 25 and 50 lb kegs		7
Dry and in Oil, 12½ lb kegs		7¼
In Oil, 25 lb tin pails		7¼
In Oil, 12½ lb tin pails		7¾
In Oil, 1, 2, 3 and 5 lb tin cans, ass't		8¾
Red Lead and Litharge:		
In 100 lb kegs		7
In 25 and 50 lb kegs		7¼
In 12½ lb kegs		7½
In lots of less than 500 lbs, ½¢ ℔ lb advance over above prices of White and Red Lead and Litharge.		
Lead, American. Terms: On lots of 500 lbs and over, 60 days, or 2% for cash if paid in 15 days from date of invoice.		
Zinc, Dry—	℔ lb	
American, dry	5¼	@ 5¾
Red Seal (French process)	6¾	@ 7
Green Seal	7¼	@ 7½
German Red Seal (French process)	7¼	@ 7¾
Green Seal	7¾	@ 8
White Seal	8¾	@ 9
French, Red Seal	7½	@ 8¼
Green Seal	.10	@10¼
Dry Colors—	℔ lb	
Black, Carbon	.5	@10
Black Drop, American	3½	@ 8
Black Drop, English	5	@15
Black, Ivory	.16	@20
Lamp, commercial	3	@ 5
Blue, Celestial	4	@ 6
Blue, Chinese	.30	@31
Blue, Prussian, Domestic	.28	@30
Blue, Ultramarine	.5	@15
Brown, Spanish	½	@ 1
Carmine, No. 40	2.65	@2.75
Green, Chrome, ordinary	3¼	@ 5
Green, Chrome, pure	.17	@25
Metallic Paint, ℔ ton, Brown	$16.50	@$22.00
Red	$14.00	@$18.00
Ocher, American ℔ ton	$12.00	@15.00
American Golden	4	@ 5
French	1¼	@ 2
Foreign Golden	3	@ 4
Orange Mineral, English	.10	@12
French	12½	@13
German	.12	@13
American	8½	@10
Red, Indian, English	5	@ 7
American	3	@ 3¼
Red, Turkey, English	4	@10
Red, Tuscan, English	7	@10
Red, Venetian, Amer. ℔ 100 lb	$0.75	@1.50
English ℔ 100 lb	$1.15	@1.60
Sienna, Italian, Burnt and Powdered	3	@ 9
Italian, Raw, Powdered	3	@ 7
American, Raw	2¼	@ 3
American Burnt and Pow'd.	2¼	@ 3
Talc, French ℔ ton	$18.00	@25.00
American ℔ ton	15.00	@25.00
Terra Alba, French ℔ 100 lb	.80	@1.00
English ℔ 100 lb	.90	@1.00
American ℔ 100 lb, No. 1	.75	@ .80
American ℔ 100 lb, No. 2	.60	@ .65
Umber, T'key, Bnt, & Pow.	2¾	@ 3
Turkey, Raw and Powdered	2¾	@ 3
Burnt, American	2	@ 2½
Raw, American	2	@ 2½
Yellow, Chrome, Pure	12¼	@13
Oxide, Red, American	2	@ 7½
Vermilion, English, Imported		@70
Chinese	$0.90	@1.00

Current Hardware Prices.

General Goods.—Goods which are made by more than one manufacturer are printed in *Italics*. The prices named represent those obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are usually given to larger buyers.

Special Goods.—Quotations printed in small type (Roman) relate to goods of particular manufacturers, who request the publication of the prices named and are responsible for their correctness. They usually represent the prices to the small trade, lower prices being generally obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued annually, a book of 376 pages, which is sent free of charge to every subscriber to *The Iron Age*. It gives a classified list of the products of our advertisers and thus serves as an up-to-date DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists," 218 pages, price $2, prepaid, contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

North's 10%
Upson's Patent 25%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent 25%
Ives' Stop Bead Screws and Washers 25%
Taplin's Perfection 25%

Anti—Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, ℔ doz. pairs, Nos. 1, $0.75; 2, $0.60; 3, $0.65; 4, $1.00; 5, $0.50.
Quick Shifter, ℔ doz. pairs ..... $2.00@$3.00
Spitzli Quick Shifter, ℔ doz. pairs ..... $1.65@$1.75

Anvils—American—

Eagle Anvils ..... ℔ lb @9 ¢
Hay-Budden, Wrought ..... 9½@9¾ ¢
Trenton ..... ℔ lb 9½@9¾ ¢

Imported—

Swedish Solid Steel Paragon, ℔ lb ..... 10@10½ ¢
Peter Wright & Sons, ℔ lb, 84 to 349 lb, 10½ ¢; 350 to 600 lb, 11¢.

Anvil, Vice and Drill—

Millers Falls Co., $18.00 ..... 15&10%

Augers and Bits—

Com. Double Spur 80%
Jennings' Patn., Bright. 65&10@70%
Black Lip or Blued ... 65@65&5%
Boring Mach. Augers 70%
Car Bits, 12-in. twist ..... 40&10%
Ford's Auger and Car Bits ..... 40&5%
Ft. Washington Auger Co. 35%
Forstner Pat. Auger Bits 25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list, 25&7½%
No. 30, R. Jennings' list 50%
Russell Jennings' ..... 25&10&2½%
Mayhew's Countersink Bits 15%
Pugh's Black 20%
Pugh's Jennings' Pattern 35%
Snell's Auger Bits ..... 60&10%
Snell's Bell Hangers' Bits 60%
Snell's Car Bits, 12-in. twist 60%
Snell's King Auger Bits 50%
Snell's Star Auger Bits ..... 50&10%
Swan's Auger Bits ..... 65&10@70%
Swan's, Jennings' Pattern 50%

Bit Stock Drills—

See *Drills, Twist.*

Expansive Bits—

Ford's, Clark's Pattern 66⅔%
C. E. Jennings & Co., Steer's Pat. 25%
Lavigne Pat., small size, $15.00; large size, $26.00 ..... 60&10%
Swan's 60%

Gimlet Bits—

	Per gro.
Common Dbl. Cut	*$3.00@$3.25*
German Pattern, Nos. 1 to 10,	*$4.75; 11 to 13, $5.25*

Hollow Augers—

Bonney Pat., per doz. .. $5.50@6.00
Ames ..... 20&10%
Universal 20%

Ship Augers and Bits—

Ship Augers ..... 40&10@50%
Ford's ..... 33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 6%
Watrous' ..... 33⅓&7½%
Snell's 50%

Awls—

Elmore Tool Mfg. Co.:
Tinners' and Brad Awls ..... 33&17%
Scratch Awls 60%

Axes—

Single Bit, base weights: Per doz.
First Quality ..... $4.75@5.00
Second Quality ..... $4.25@4.50
Double Bit, base weights:
First Quality ..... $7.00@7.50
Second Quality ..... $6.50@6.75

Axles— *Iron or Steel.*

Concord, Loose Collar ... 4¼@4½¢
Concord, Solid Collar ... 4½@5 ¢
No. 1 Common, Loose ... 3½@4 ¢
No. 1½ Com., New Style. 4¼@4¾¢
No. 2 Solid Collar ... 4¼@4¾¢
Half Patent:
Nos. 7, 8, 11 and 12 ..... 70%
Nos. 13 to 14 ..... 70%
Nos. 15 to 18 ... 70&10@70&10&5%
Nos. 19 to 22 ... 70&10@70&10&5%

Boxes, Axles—

Common and Concord, not turned ..... lb., 5@6¢
Common and Concord, turned, lb., 6@7¢
Half Patent ..... lb., 9½@10¢

Bait— Fishing—

Hendryx:
A Bait 20%
B Bait 25%
Competitor Bait ..... 20&5%

Balances— Sash—

Caldwell new list ..... 50&10%
Pullman ..... 50&10%

Spring—

Light Spring Balances. 50&10@60%
Chatillon's:
Light Spg. Balances ..... 50&10@60%
Straight Balances ..... 40&10@50%
Circular Balances ..... 50&10@60%
Large Dial ..... 30@30&10%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb. .... per lb., 2¾@3¢

Prying and Pinch—

Elmore Tool Mfg. Co. 75%

Towel—

No. 10 Ideal, Nickel Plate .. ℔ gro. $8.50

Beams, Scale—

Scale Beams ..... 40@40&10%
Chattillon's No. 1 ..... 30%
Chatillon's No. 2 ..... 40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.80; Tinned $0.85
No. 11 Wire Coppered ℔ doz. $1.15; Tinned $1.20
No. 10 Wire Tinned ..... ℔ doz. $1.50

Beaters Egg—

Dover Stamping & Mfg. Co.:
Genuine Dover, per gro., No. 1, Tumbler Size, $7.50; No. 2, Family Size, $7.50; No. 3, Extra Family Size, $24.00; No. 4, Hotel Size, $29.00.
Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, $0.80; No. A, Jap'd, $1.15; No. B, Jap'd, $1.85; No. 6, Jap'd, $1.65.
Lyon, Jap'd, per doz., No. 2, $1.35.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.

Bellows—

Blacksmith, Standard List:
Split Leather ..... 60@60&10%
Grain Leather ..... 50@50&10%

Hand—

Inch..	6	7	8	9	10
Doz..	$4.50	5.50	6.00	7.00	7.50

Molders—

Inch..	10	12	14	16
Doz..	$8.50	11.00	13.50	14.50

Net Prices.

Bells— Cow—

Wrought Cow Bells 75%
Jersey ..... 75&10%
Texas Star 50%

Door—

Reading Hardware Co. 50%
Home, R. & E. Mfg. Co.'s ..... 55&10%

Hand—

Polished, Brass ..... 60@60&10%
White Metal ..... 60@60&10%
Nickel Plated ..... 50&10%
Swiss ..... 50&10%

Miscellaneous—

Farm Bells ..... lb., 2½@3¢
Church and School .... 60@60&5%

Belting— Leather—

Extra Hvy. Single and Dble. 55%
Heavy, Single and Double ... 60%
Medium, Single and Double, 60&10%
Light, Single and Double, 60&10&10%
Shoulder, Single and Double. 75%
Standard ..... 70&10%
Cut Leather Lacing, Strictly No. 1 ..... 45%
Leather Lacing Sides, per sq. ft, Raw Hide, No. 1, in sides 17 sq. ft. and over, No. 1, 27¢; No. 2, under 17 sq. ft. ..... 26¢

Rubber—

Competition (Low Grade), 70&10@75%
Standard ..... 60&10&10%
Best Grades ..... 50&10&10%

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1909 list:
Chain, Parts, Spokes 50%
Tubes 60%

Blocks Tackle—

Common Wooden .... 75@75&10%
Lane's Patent Automatic Lock and Junior 30%
See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined. 50&10@60%
Embossed ..... 50&10@60%

Bobs, Plumb—

Keuffel & Esser Co. ..... 33⅓&10%

Bolts

Carriage, Machine, &c.—

Common Carriage (cut thread):
⅜ x 6 and smaller .... 70&7½%
Larger and longer .... 65&5%
Common Carriage (rolled thread):
⅜ x 6, smaller and shorter, 70&12½%
Phila. Eagle, $3.00 list .. 80@—%
Bolt Ends, with C. & T. Nuts, 65&5%
Machine (Cut Thread):
⅜ x 4 and smaller .... 70&12½%
Larger and longer .... 65&10%

Door and Shutter—

Wrought Iron:
Wrought Barrel Japanned, 80&10&10@85%
Barrel Bronzed .... 60&10@70%
Spring ..... 70&10&10@80%
Square Neck ..... 75&10@80%
Square ..... 80@80&10%
Ives' Mortise Door 25%
Ives' Wrought Door 25%

Expansion—

F. H. Evans' Crescent ..... 40@60%
Richards Mfg. Co. ..... 55&10%
Star Expansion Bolt Co.:
Star, Lag Screw Type .. 60&10&5&2½%
Star, Wood Screw Type 40%
Star, Machine, Single Wedge 60%
Star, Machine, Double Wedge. 60&10%
Star Toggle Bolts 60%
Steward & Romain Mfg. Co.:
Style No. 13, Double ..... 60@10%
Style No. 1, Single ..... 60@10%
Style No. 100, Dbl. Jaw, Single. 55%
Lag Screw 66⅔%
Star Screw Anchors, Hollow 40%

Plow and Stove—

Plow ..... 65&5@70%
Stove ..... 85&5@85&10%

Tire—

Common Iron 80%
Norway Iron 80%
American Screw Co.:
Norway Phila., list Oct. 16, '84.. 80%
Eagle Phila., list Oct. 16, '84. 82½%
Bay State, list Dec. 28, '99 ..... 80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84..80%
Eagle Phila., list Oct. 16, '84...82½%
Eclipse, list Dec. 28, '99 ..... 80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99 ..... 80%
Norway Phila., list Oct. '84 ..... 80%
Eagle 82½%
Shelton Co.:
Tiger Brand, list Dec. 28, '99 ... 80%
Phila., Eagle, list Oct. 16, 1884..82½%
Upson Nut Co.:
Tire Bolts 80%

Borers, Bung—

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.75; No. 3, $2.50 each 25%

Boxes, Mitre—

C. E. Jennings & Co. 25%
Langdon, New Langdon and Langdon Improved, 20&10%; Langdon Acme ..... 15&10%

Braces—

Common Ball ..... $1.50@$1.75
Barber's ..... 50&10&10@60&10%
Fray's Genuine Spofford's 60%
Fray's No. 61, 166, 206, 614 ..... 50%
C. E. Jennings & Co. ..... 50&5%
Mayhew's Ratchet 40%
Mayhew's Quick Action Hay Patent ..... 40&10%
Millers Falls Drill Braces ..... 25&10%
P. S. & W. Co., Peck's Pat Revised List ..... 60@60&5%

Brackets—

Wrought Steel ..... 80@80&5%
Griffin's Pressed Steel ..... 75@75&10%
Griffin's Folding Brackets ..... 70&10%
Stanley's Pressed Steel ..... 75&10&5%
Stanley's Folding Brackets .. 70&10&5%
Taplin Victor Handy Egg Beater Bracket ..... ℔ doz. $1.50

Broilers—

Kilbourne Mfg. Co. ..... 75&20%
Wire Goods Co. ..... 75&10%

Butts— Brass—

Wrought 65%
Cast Brass, Tiebout's ..... 60&10%

Wrought Steel—

BRIGHT.
Light Narrow, Light Reversible ..... 75&5%
Reversible and Broad. 75&10%
Loose Joint, Narrow, Light Inside Blind, &c. 75%
Back Flaps, Table Chest. 70%
BRONZED.
Light Narrow, Loose Pin.. 55%
Light, Loose Pin, Ball Tip. 65%
Broad 55%

Extra, 5 @ —

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, net list; 1200, 15%; 200, 300, 900 ..... 30%
Hendryx Bronze: Series 700, 800 .... 30%
Hendryx Enameled 35%

Calks, Toe and Heel—

Blunt, 1 prong, per 100 lb., $3.50@$3.85
Sharp, 1 prong, per 100 lb., $4.00@$4.35
Burke's, 1 pg. Blunt Toe, 3¾¢; 2 pg. Blunt Toe, 4¼¢; 1 pg. Sharp Toe, 4¼¢; 2 pg. Sharp, 4¾¢; Blunt Heel, 4¼¢; Sharp Heel.....4¾¢
Perkins', Blunt, ℔ lb, 3.65¢; Sharp, 4.15¢

Caps— Primers—

Berdan Primers, $2 per M..20&5%
Primer Shells and Bullets..15&10%
All other primers per M..$1.52@1.60

Cartridges—

Blank Cartridges:
32 C. F., $5.50.....10&5%
38 C. F., $7.00.....10&5%
22 cal. Rim, $1.50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con. Ball, Swgd..$190
B. B. Caps, Round Ball.....$1.40
Central Fire.....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets..15&10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15&5%

Casters—

Bed .....65&10@70%
Plate .....60@60&10%
Philadelphia .....70&10@75%
Gem (Roller Bearing).....70&10&10&5%
Steel Gem (Roller Bearing).....70%
Standard Ball Bearing.....45%
Yale (Double Wheel) low list...40&10%

Chain, Proof Coil—

American Coil, Straight Link:

3-16	¼	5-16	⅜	½	⅝
$7.70	5.05	4.10	3.50	3.35	3.25

¾-⅞-1. 1⅛ to 1¼ inch.
$3.15 3.25
German Coil.....70&5%
German Pattern Coil:
6-0 to 1.....70&10&5%
2 and 3.....60&10&10@70%
4, 5 and 6.....50&10@50&10&5%

Halter—

Halter Chains.....60&5@60&10%
German Pattern Halter Chains, list July 2½, '97.....70&5%
Covert Mfg. Co.:
Halter .....30&10&10%

Trace, Wagon, &c.-

Traces, Western Standard: 100 pr.
6¼—6-3, Straight, with ring..$26.00
6½—6-2, Straight, with ring..$27.00
6½—8-2, Straight, with ring..$30.00
6½—10-2, Straight, with ring..$35.00
NOTE.—Add 2c per pair for Hooks Twist Traces: add per pair for Nos. 2 and 3, 2c; No. 1, 3c; No. 0, 4c to price of Straight Link.
Eastern Standard Traces, Wagon Chain, &c.....70&10@—%

Miscellaneous—

Jack Chain:
Iron .....60&10&10@70%
Brass .....60&10&10@70%
Safety and Plumbers' Chain..75%
Gal. Pump Chain....lb., 4½@5%
Bridgeport Chain Co.:
Triumph Halter and Coil..35&2½@40%
Triumph Dog.....50&10@60%
Brown Halter and Coil.....45@50&5%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion, Post.....30&10&10%
Oneida Community:
American Halter, Dog and Kennel Chains .....35&2½@40%
Niagara Dog Leads and Kennel Chains .....45@50&5%
Wire Goods Co.:
Dog Chain.....70%
Universal Dbl.-Jointed Chain..50&10%

Chain and Ribbon, Sash—

Oneida Community:
Steel Chain.....60%
Pullman:
Bronze Chain, 60%; Steel Chain, Coppered .....60&10%
Sash Chain Attachments, per set..88¢
Aluminoy Sash Ribbon, per 100 ft. .....$2.00@$5.00
Sash Ribbon Attachments, per set..8¢

Chalk—

Carpenters' Blue....gro., 50@55¢
Carpenters' Red.....gro., 50@55¢
Carpenters' White...gro., 40@45¢

Checks, Door—

Bardsley's .....30&4%
Reading, Ogden.....20&5%
Pullman, per gro.....$54.00
Russwin .....30&4%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters, etc., Chests, with Tools 20%
Machinists' and Pipe Fitters' Chests, Empty.....15%
Tool Cabinets.....15%
C. E. Jennings & Co.'s Machinists' Tool Chests.....7½%

Chisels—

Socket Framing and Firmer

Standard List.....80&10@—%
Buck Bros.....30%
C. E. Jennings & Co.:
Socket Firmer No. 10.....25&7½%
Socket Framing No. 15.....25&7½%
R. & E. Mfg. Co.....70@70&10%
Swan's .....66⅔@70%
L. & I. J. White & Co.....30@30&5%

Tanged—

Tanged Firmers.....35&10@40%
Buck Bros.....30%
C. E. Jennings & Co. Nos. 191, 181..25%
R. & E. Mfg. Co.....25@30&5%
L. & I. J. White Co.....25&5%

Box—

Elmore Tool Mfg. Co.....50%

Cold— lb.

Cold Chisels, good quality..13@15¢
Cold Chisels, fair quality..11@12¢
Cold Chisels, ordinary.... 9@10¢
Elmore Tool Mfg. Co.:
Cold Chisels.....50&5%

Chucks—

Almond Drill Chucks.....35%
Almond Turret Six-Tool Chuck.....40%
Beach Pat, each $8.00.....35&5%
Cincinnati Chuck Co.:
Independent 4-jaw Reversible.....35%
Jacobs' Drill Chucks.....35%
Skinner Lathe Chucks:
Independent 35%
Universal, Reversible Jaws.....35%
Universal, Com. Style Jaws.....40%
Combination, Reversible Jaws.....35%
Combination, Com. Style Jaws...40%
Round Body or Box Body, 2 Chuck Jaws 25%
Geared Scroll Chucks.....25%
Drill Chucks:
New Model, 25%; Geared Pattern, 25%; Skinner Patent, ...25%
Positive Drive.....40%
Planer Chucks.....20%
Standard 45%
Drill Press Vises.....30%
Face Plate Jaws.....35%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21.....35%
Scroll Combinations, Nos. 83 and 84 .....30%
Geared Scroll, Nos. 33, 34 and 35..25%
Independent Iron, Nos. 18 and 318.35%
Independent Steel, No. 64.....25%
Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104.....35%
Union Czar Drill.....25%
Union Geared Drill Chuck.....25%
Universal, 11, 12, 16, 17, 13, 14, 15..40%
Universal No. 42.....35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50.....35%
Steel Face Plate Jaws, Nos. 70 and 72 .....30%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill...50%
Little Giant Drill, Improved.....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%

Clamps—

Carriage Makers', Star, P., S. & W. Co. .....50@50&5%
Besly, Parallel.....33⅓&10%
Hammer & Co.:
Adjustable .....20&5%
Carriage Makers' H. P. Screw..40&5%
Myers', Standard and Wenzelmann Hay Rack.....50%
Saw Clamps, see Vises, Saw Filers'

Cleaners, Drain,

Iwan's Champion, Adjustable.....50%
Iwan's Champion, Stationary....40&5%

Cleavers, Butchers'—

Foster Bros.....30%
L. & I. J. White Co.....30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Co.:
1902 Chicago Horse, each..$10.75
20th Century Horse, each...$5.00
Lightning Belt Horse, each,$15.00
Chicago Belt Horse, each..$20.00
Stewart's Enclosed Gear Ball Bearing Horse, each.....$7.50
Stewart's New Model Sheep Shearing Machine, each.$12.75
Stewart Enclosed Gear Shearing Machine, No. 8, each..$9.75
} 35%

Clips, Axle—

Regular Styles.....80&80&10%

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c 75%
Compression Bibbs.....75%

Compasses, Dividers, &c.

Ordinary Goods.....75@75&5%

Conductor Pipe,—

All territories, L. C. L.
Galvanized Steel..75&10&5@—%
Charcoal .....50&10&7½@—%
Copper .....50&10@—%
Terms, 60 days: 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:

Galvanized, Lined, side handles, Gal....	2	3	4	6	8
Each ...	$1.30	1.60	2.00	2.30	3.00
White Enameled Lined, Side Handles: Gal....	2	3	4	6	8
Each ...	$2.40	2.80	3.50	4.50	5.60
Agate Lined, Side Handles: Gal....	2	3	4	6	8
Each ...	$3.00	3.40	4.30	5.30	6.60

} 10%

Coppers, Soldering—

Soldering Coppers, 3 lb. to pair and heavier, 21¢; lighter than 3 lb. to pair.....23¢

Cord— Sash—

Braided, Drab.....lb. 35¢
Braided, White, Com., See Notes on Prices.
Cable Laid Italian, lb., No. 18..37¢
Italian, lb., A, No. 18, 25¢; B, 22¢
Common India.....lb., 11@11½¢
Cotton Sash Cord, Tw'd..18½@22¢
Patent Russia.....lb....20¢
Cable Laid Russia.....lb...21¢
India Hemp, Br'd'd.....lb...21¢
India Hemp, Twisted...lb..13@14¢
Patent India, Twisted..lb...17¢
Eddystone, Braided, Nos. 8 to 12, 26¢; 7, 26½; 6, 27½¢.
Harmony Cable Laid Italian, Nos. 1 to10.....℔ lb 23¢
Pullman:
Wire Sash Cord.....10%
Sash Cord Attachments, per 100..$2.00
Samson, Nos. 8 to 12:
Braided, ℔ lb., Drab Cotton, 55¢; Italian Hemp, 40¢@50¢; Linen, 65¢; White Cotton, 50¢; Spot Cord.....50¢
Massachusetts, White...℔ lb 40¢
Massachusetts, Drab...℔ lb 45¢
Phoenix, White, Nos 8 to 12....27¢
} 15%
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen....57½¢
See also Chain and Ribbon.

Wire, Picture—

Full Length.....90@—%
Short Length.....90&20@—%
Hendryx Standard Wire Picture Cord. 90&10%
Turner & Stanton Co. Wire Picture Cord .....90&10%

Cradles—

Grain 50%

Crayons—

White Round Crayons, Cases, 100 gro., $8.00, $8.50, $9.00 and $10.00 according to grade.
Zelnicker's Lumber: ℔ gro.
White and Purple, Indelible....$7.50
Blue, Red, Green, Yellow and Terra Cotta, $6.50; Black.....$4.50
Giant Lumber, 5¼ in. x 15-16 in. round, all colors, $12.00; Indelibles, $14.00; Blacks.....$10.00
Genuine Soapstone, Metal Workers', 5 in. x ¼ in. Round, $2.50; 5 in. x ¼ in. Square, $1.75; 5 x ½ x 3-16, $2.50; 5 x 1¼ x 3-16.....$3.00
Suremark, Black, $2.25; Blue, Red and Yellow.....$2.50

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847 ℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....℔ doz. $3.00
Wm. Rogers & Son.....℔ doz. $2.50

Cutters— Glass—

H. H. Mayhew Co.....40&5%

Meat and Food—

Enterprise:

Nos..	5	10	12	22	32
Each	$1.75	$2.50	$2.25	$4	$5

25@25&7½%
No. 202, $1.50.....40&7½%
P., S. & W. Co.:
Ideal .....40@40&5%
Hales .....60&5%
Little Giant.....℔ doz. 40@50%

Nos..	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$88.00

New Triumph No. 605, ℔ doz. $24.00.
Russwin Food. No. 1, $24.00; No. 2, $27.00; 3, $12.00.....45&10&10%
$15.00 $18.00

Slaw and Kraut—

Henry Disston & Sons:
Slaw and Kraut Cutters.....35%
Corn Graters.....30%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....℔ doz. $3.00
Combined Slaw Cutter and Corn Grater .....℔ doz. $4.00

Tobacco—

Enterprise .....25@30%

Diggers, Post Hole, &c—

Disston's:
Rapid, ℔ doz., $24.00.....25%
Samson, ℔ doz., $24.00.....25%
Iwan's Pat. Post Hole and Well Auger 40%
Vaughan Pattern Post Hole Augers, 4 to 9 in., ℔ doz.....$6.25
Perfection Post Hole Diggers, ℔ doz. $8.25
Split Handle Post Hole Diggers, ℔ doz., $7.25
Hercules Pattern, ℔ doz.....$8.75
Kohler's, ℔ doz., Universal, $14.00; Little Giant, $12.00; Genuine Hercules, $10.00; Invincible, $9.00; Rival, $8.50; Pioneer.....$7.50
Never-Break Crucible Steel Post Hole Diggers 60%

Dressers Emery Wheel—

Sterling Emery Wheel Dressers.....35%
Sterling Wheel Dresser Cutters.....35%

Drills and Drill Stocks—

Blacksmith's Common Drilling Machines .....$1.50@1.75
Breast, Millers Falls.....15&10%
Breast, P., S. & W.....30&10%
C. & C. Ratchet.....25%
Reversible Ratchet Die Stocks....25%
Forbes Die Stocks.....5%
Goodell Automatic Drills.50&10@60&10%
Millers Falls Automatic Drills, Graves', per doz., Nos. 1, $4.86; 2, $8.16.
Millers Falls Automatic Drills.33⅓&10%
Noyes Repair Shop Drill No. 10....20%
Ratchet, Parker's.....40%
Ratchet, Weston's, Styles A and B.50%
Ratchet, Weston's, Styles C, D and F 45%
Ratchet, Weston's, Style H Improved 45%
Ratchet, No. 012.....50%
Ratchet, Celebrated.....50%
Ratchet, Whitney's, P., S. & W..50%
Star Drills.....60%
Star Pipe Drills.....50&10%
Sebco Extension Drills.....40&10&5%
Star Drill Holders.....50&10&10%
Star Drill Points.....50&10&10%

Twist Drills—

Bit Stock.....70@70&10%
Taper and Straight Shank, 65@65&10%

Drivers, Screw—

Buck Bros.' Screw Driver Bits.....30%
Disston's Screw Drivers, Handles and Ferrules 70%
Elmore Tool Mfg. Co.:
Elmore 60%
Hartford 66⅔%
Indestructible .....55&7½%
Standard Neverturn.....66⅔%
Star .....75&5%
Screw Driver Bits.....25%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Ford's Brace Screw Drivers....40&10%
Gay's Double Action Ratchet.....35%
Goodell's Auto.....65@65&10%
Mayhew's Black Handle.....45%
Mayhew's Monarch.....45%
Millers Falls, ℔ doz., Nos. 11, $9.95; 12, $13.73; 20, $8.17; 21, $8.46; 41, $13.43; 42, $17.21.
Swan's:
Nos. 7565 to 7568, 60%; No. 7540, 40&10%

Eave Trough, Galvanized—

All territories.
Galvanized Steel...80&10&10@—%
Copper .....50&10@—%
Terms.—2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel, Galv. C. I. and Copper.
Sizes 2, 3, 4.....80%
Sizes 1½, 2½, 3½, 5, 6...60&10%
No. 26.....50%
No. 24.....25%
Copper Elbows.....50%

Emery, Turkish—

	4 to 46:	5½ to 220:	Flour.
Kegs .....lb.	*5 ¢*	*5½¢*	*5¼¢*
½ Kegs.....lb.	*5¼¢*	*5¾¢*	*5¾¢*
¼ Kegs.....lb.	*5½¢*	*6 ¢*	*6 ¢*
10-lb. cans, 10 in case....6½¢	*7 ¢*	*6 ¢*	
10-lb. cans, less than 10.....10 ¢	*10 ¢*	*8 ¢*	
Less quantity..10 ¢	*10 ¢*	*8 ¢*	

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extensions, Bit—

Ford's Auger Bit Extensions....40&5%

Extinguishers—Fire

Royal Mfg. Co. Fire, ℔ doz., $12.00 .....50%

Fasteners, Blind—

Upson's Patent.....25%
Walling's 50%
Zimmerman's Jap'd and Galv., 65%; Bronze and Plated.....50%

Cord and Weight—

Ives, ℔ gro., $1.08.....25%
Titan, ℔ gro., $0.66.....25%

Corrugated—

Acme Corrugated Fasteners.....70%

Faucets—

Cork Lined.....50&10@60%
Metallic Key, Leather Lined, .. 60&10@70%
Red Cedar.....40&5@40&10&5%
Petroleum .....70&10@75%

John Sommer Faucet Co.:
Peerless Tin Key.....40%
Boss Tin Key.....50%
Victor Metal Key.....50&10%
Duplex Metal Key.....60%
Diamond Lock.....40%
I.X.L. Cork Lined.....50%
Reliable Cork Lined.....50&10%
Chicago Cork Lined.....60%
O. K. Cork Lined.....50%
No Brand, Cedar.....50%
Perfection, Cedar.....30%

Self Measuring:
Enterprise, Self Measuring and Pump, ₱ doz., $36.00.....40&10%
Lane's, ₱ doz., $36.00.....40&10%

Files— Domestic—

Best Brands.....70&10@75&10%
Standard Brands.....75&10@80%
Lower Grade....75&10&10@80&10%

Disston's Superfine.....60%
Fitchburg.....80%
Heller Bros.....70&10@75&10%
Liveright Bros., Gold Medal.....70%
McCaffrey's American Standard, 60&10&10%
McCaffrey's Swiss Pattern.....45&10%
Simonds.....70%

Fixtures, Fire Door—

Richards Mfg. Co.:
Universal, No. 103; Special, No. 104.....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—

Net Prices:

Inch	15	17	19	21
Per doz.	$3.00	3.25	3.55	4.00

Peck, Stow & Wilcox Co.:

In.	15	17	19	21	24	
	$4.00	4.40	4.75	5.50	6.50	20%

Reading Hardware Co.....50&10%

Frames— Wood Saw—

White, S'g't Bar, per doz.80@$1.00
Red, S'g't Bar, per doz.$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.	1	2	3	4	6	
Each	$1.25	$1.60	$1.90	$2.20	$2.80	10&2½%

Fuse— *Per 1000 Feet.*

Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped.. 3.65
Waterproof Dbl. Taped.. 4.40
Waterproof Tpl. Taped.. 5.15

Gates, Molasses and Oil—

Stebbins' Pattern.....80%

Gauges—

Marking, Mortise, &c..50@50&10%

Chapin-Stephens Co.:
Marking, Mortise, &c.....50&50&10%
Disston's Marking, Mortise, &c.60&10%
Wire, Brown & Sharpe's.....33⅓%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....25%

Gimlets— Single Cut—

Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glasses, Level—

Chapin-Stephens Co.....65@65&10%
Disston & Sons.....60&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush, 25&10@50%

Grease, Axle—

Common Grade...gro.$6.00@$6.50
Dixon's Ererlasting, 10-lb. pails, ea. 85¢; in boxes, ₱ doz., 1 lb, $1.20; 2 lb.....$2.00
Helmet Hard Oil.....25%

Griddles, Soapstone—

Pike Mfg. Co.....33⅓@33⅓&10%

Grinders—

Pike Mfg. Co.:
Hand and Foot Power, Pyko Nos. 1, 2, 3; Pyko Primo; Pyko Peerless; Pyko Spiral (foot power).33⅓%
Mower Knife and Tool, $5.00..40&10%
Royal Mfg. Co.:
Hand Power, each, Nos. 01, $1.75; 02, $2.25; 1A, $2.50; 1B $3.25.....33⅓%
Foot Power, No. 10, $5.00.....33⅓%
Encased Gears, No. 15, Hand Power, $13.50; Combined Hand and Foot Power, $15.00.....33⅓%
Lawn Mower Grinder, No. 40, $3.75.....33⅓%
Sickle Grinder, each, No. 20, $5.00.....33⅓%
Cast or Cut Gears.

Grindstones—

Pike Mfg. Co.:
Improved Family Grindstones, ₱ inch, ₱ doz., $2.00.....33⅓%
Richards Mfg. Co., Eli and Cycle, Ball Bearing, mounted.....40%

Grips, Nipple—

Perfect Nipple Grips.....40&10&2%

Halters and Ties—

Cow Ties.....70&10@—%

Bridgeport Chain Co.:
Triumph Coil and Halters.35&2½@40%
Brown Coil and Halters...45@50&5%
Brown Cow Ties.....50@50&5%
Brown Tie Outs.....70&10@75&5%

Covert Mfg. Co.:
Web.....30&10%
Jute Rope.....55%
Sisal Rope.....45%
Cotton Rope.....55%
Hemp Rope.....45%

Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....35&2½@40%
Niagara Coil and Halters...45@50&5%
Niagara Cow Ties.....50%

Hammers—

Handled Hammers—

Heller's Machinists'..65&10@65&10&10%
Heller's Farriers'.....40@40&10%
Peck, Stow & Wilcox Co.:
Crucible Steel.....50%
Farriers'.....50%
Riveting.....50%
Machinists'.....50%
Blacksmiths'.....50%
Elmore Shoemakers' Hammers.....75%
Victor Magnetic Tack, ₱ gro....$7.75

Heavy Hammers and Sledges—

3 to 5 lb., 40¢.....80&10&10%
Over 5 lb, 30¢.....80&10&10&10%

Handles—

Agricultural Tool Handles

Axe, Pick, &c...60&10@60&10&10%
Hoe, Rake, &c.....30&5@30&10%
Fork, Shovel, Spade, &c.:
Long Handles.....30&5&30&10%
D Handles.....30&5@30&10%

Cross-Cut Saw Handles—

Atkins'.....35%
Disston's Handles and Saw Tabs..45%

Mechanics' Tool Handles—

Auger, assorted...gro.$3.00@$3.50
Brad Awl.....gro.$1.65@$1.75
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory.....$2.15@2.40
Socket Firming, Apple, $1.75@ $1.95; Hickory.....1.60@1.75
Socket Framing, Hickory, $1.60@$1.75
File, assorted.....gro.$1.25@$1.50
Hammer, Hatchet, &c., 60&10@60&10&5%
Hand Saw, Varnished,doz., 80¢; Not Varnished .....70@75¢
Plane Handles:
Jack, doz., 25¢; Fore, doz..40¢

Chapin-Stephens Co.:
Carving Tool.....30@30&10%
Chisel.....60@60&10%
File and Awl.....60@60&10%
Saw and Plane.....30@30&10%
Screw Driver.....30@30&10%
Millers Falls Adj. and Ratchet Auger Handles.....15&10%
Nicholson Simplicity File Handle.... ₱ gro. $0.85@$1.50
J. L. Osgood:
Indestructible File and Tool, ₱ gro., No. 1, $8.00; No. 2, $8.50; No. 3, $9.00; No. 4, $9.50; No. 5, $10.00.....gro. lots 10%
W. A. Zelnicker Supply Co.:
Hammer, ₱ doz., 12 in., $2.00; 14 in., $2.00; 16 in., $2.30; 18 12., $2.50; 20 in., $2.70; 22 in., $3.00; 24 in., $3.30; 26 in., $3.50; 30 in., $3.80.
Sledge, ₱ doz., oval, 30 in., $3.80; octagon, 30 in., $3.80; oval, 36 in., $4.00; octagon, 36 in., $4.00.
Axe, ₱ doz., 28 to 34 in., $5.60; 36 in., $5.80.
Adze, ₱ doz., 36 in., $5.80; 36 in., $7.80.
Pick, ₱ doz., R. R., 36 in., $8.00; coal, 34 in., $5.80.
Hatchet, ₱ doz., 12 to 14 in., $2.00.

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track and Parlor Door Hangers per double set with track, &c.

Chicago Spring Butt Co.:
Friction.....25%
Oscillating.....25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator.....30%
Railroad.....50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10%
Roller Bearing.....70%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00..60&10%
Roller Bearing, No. 11, $15.00, 60&10%
Roller Bearing, Ex. Hy., No. 22, $18.00.....60&10%
Bull Dog, $24.00.....70%
Lane Bros. Co.:
Parlor, Ball Bearing, $1.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion per set of 4 Hangers, complete with track.....$2.25
Barn Door, Standard.....60&10%
Hinged.....net $6.08
Covered.....60&5%
Special.....70&5%
Trolley Hangers and track...50%
Lawrence Bros.:
Cleveland.....70&7½%
Clipper, No. 75.....60%
Crown.....55&10%
Cyclone, No. 40.....net $6.50
Tandem, No. 50.....net $7.50
New York.....55&10%
Trolley, No. 30, ₱ pair.....$1.25
McKinney Mfg. Co.:
Roller Bearing, Nos. 1 and 2..70%
Anti-Friction.....60%
Hinged Hangers, King Charm.60%
F. E. Myers & Bro. Stayon; O K; O K Adjustable; Sure Grip; Sure Grip Adjustable; Sure Grip Tandem; Sure Grip Tandem Adjustable; Tandem Adjustable.....60%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track, No. 3..$2.25
Roller B'r'g St'l Track No. 12.$2.20
Roller B'r'g St'l Track No. 13.$2.50
Roller B'r'g, Nos. 39, 41, 43, 70&7½%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22..50&5%
Trolley B, D, No. 17, $1.25; F. D, No. 120, $2.25; No. 121, $2.45; No. 150.....$2.50
Safety Underwriters F. D. No. 101.....50%
Tandem No. 41..2½ and 3 60&10%
Palace, Adjustable Track No. 132.....50&5%
Royal, Adjustable Track No. 122.....50&10%
Ives' Wood Track No. 1.....$2.25
Trolley B, D, No. 20.....50&10%
Trolley B, D, No. 24, $1.30; No. 27, $1.40; No. 28.....$1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2.70&7½%
Anti-friction, No. 42; No. 44, sizes 2½ and 3.....60%
Hinged Tandem No. 48....60&5%
Folding Door B. B, Swivel No. 135.....40%

Extra 5&10% often given.

Hangers— Garment—

Pullman Trouser, ₱ gro., No. 1 $9.00; No. 4, $21.00; No. 5, $16.50; No. 8, Black Enamel, $7.50; No. 10, $21.00; No. 12, $8.00; No. 15, Rods, $9.00; No. 18, Loops.....$10.00
Victor Folding.....₱ gro. $9.60

Joist and Timber—

Lane Bros. Co.....35%

Hasps—

Griffin's Security Hasp.....50&10%
McKinney's Perfect Hasp, ₱ doz..60%

Hatchets—

Regular list, first qual.50&10@60%
Second quality.....60@60&10%

Heaters, Carriage—

Clark, No. 5, $1.25; No. 5B, $1.50; No. 3, $1.75; No. 3D, $2.00; No. 1, $3.00.....25%
Big Hit Assortment, ₱ case....$13.80
Leader, ₱ case.....$9.00
Clark Coal, doz.....$0.75
A B C Coal, doz.....$0.60
Sadiron Coal, box 50 pieces.....$0.75

Hinges—

Blind and Shutter Hinges

Surface Gravity Locking Blind: Doz. Sets with Fastenings, No. 1, $0.75; No. 3, $1.40; No. 5, $2.85.

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70@75%
Parker Wire Goods Co.
Hale & Benjamin Automatic Blind Hinges.....20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....50&10%
Stanley's Steel Gravity Blind Hinges, No. 1647½, ₱ doz. sets, without screws, $1.00; with screws, $1.30.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&5%
Acme, Lull & Porter.....75%
Queen City Reversible.....75%
Shepard's Noiseless, Nos. 60, 65, 55.....75&5%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&5%
Clark's O, P., No. 1.....75&10%
Clark's O, P., Nos. 3 and 5....75&5%
Tip Pat'n, No. 1.....75&10%
Clark's No. 3.....75&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....70&10&5%
Shepard's Double Locking.....75%
Champion Gravity Locking.....75&5%
Pioneer.....75&10%
Empire.....65%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60&10%

Gate Hinges—

Western:
With Latch.....doz. $1.75
Without Latch.....doz..$1.15

Wrightsville Hardware Co.:
Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3.....70%

Miscellaneous—

Griffin Mfg. Co., Fleur de Lis Surface Hinges, ₱ doz. prs.....$1.00

Pivot Hinges—

Bommer Bros. Pivot, Ball Bearing.....40%
Lawson Mfg. Co., Matchless..50&10%

Spring Hinges—

Holdback, Cast Iron..$5.25@$5.75
Non-Holdback, C'st Iron$6.50@$6.75

J. Bardsley:
Simplex Spring Hinges.....40%
Bardsley's Patent Checking.33⅓%
Bommer Bros.:
Spring Butt Hinges.....40%
Surface Floor, Ball Bearing.....40%
Mortise Floor, Ball Bearing.40%
Lavatory Hinges.....40%
Non-Holdback Screen Door, Nos. 2000 and 900.....40%
Holdback Screen Door, No. 900.....₱ gro, $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triplex Spring Hinges.....50%
Chicago (Ball Bearing) Floor.50%
Chicago Engine House.....25%
Lavatory Door Hinges.....50%
Adjustable Screen Door.....60%
Non-Holdback.....65%
Lawson Mfg. Co.:
Matchless Spring Hinges.....30&10&10%
Matchless Jamb Hinges.....30&10&10%
Lavatory.....50&10%
Surface Floor.....60&10%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges.....40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....₱ gr, $9.00
No. 777, Sheet Steel Holdb'k, ₱ gr.....$9.00
No. 888, Non-Holdback, ₱ gro.....$9.00
Chief Ball Bearings Floor Hinge.....50%
Ball Bearing Door.....40%
Superior Spring Hinge Co.:
Superior Floor Hinges.....40%
Spring Hinges.....40%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c.:
Light Strap Hinges....65%
Heavy Strap Hinges....75%
Light T Hinges.....60%
Heavy T Hinges....40&10%
Extra Hvy. T Hinges.65&10%
Hinge Hasps.....40%
Cor. Heavy Strap.....75%
Cor. Ex. Heavy T...65&10%

Extra, 5&10%

Screw Hook and Strap.
6 to 12 in..lb. 3½¢
1½ to 20 in..lb. 3½¢
22 to 36 in..lb. 3 ¢

Screw Hook and Eye:
⅜ to 1 inch.....lb. 5@5½¢
⅝-inch .....lb. 6@6½¢
½-inch .....lb. 7@7½¢

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers.30&10%

Hods— Coal—

Net, per dozen.

Inch	15	16	17	18
Galv., open	$2.15	2.40	2.55	2.80
Jap., open	1.65	1.75	1.90	2.30
Galv., funnel	2.60	2.90	3.10	3.35
Jap., funnel	2.00	2.15	2.40	2.60

Masons' Etc.

Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $1.05
Steel Mortar, No. 158.....each $1.35

Hoes— Eye—

Scovil and Oval Pattern, 60&10@60&10&10%
Grub, list Feb. 23, 1899, 70&10@70&10&10%
D. & H. Scovil.....27½%

Handled—

Cronk's Weeding, No. 1, $2.00; No. 2, $2.50
Star Double Bit.....$2.50

Holders— Bit—

Angular, ₩ doz. $21.00.....45&10%

Broom—

Pullman Broom, ₩ gro.....$9.00

Door—

Barcsley's, Iron, 40%; Bronze.....20%
Empire 50%
Pullman 25%
Richards Mfg. Co.: No. 117, Ex.-ready, 40%; Nos. 118, 119, Sure Grip 50%
Superior 40%

File and Tool—

Nicholson File Holders and File Handles .....33⅓@40%

Fruit Jar—

Triumph Fruit Jar Holder, ₩ doz.$2.00

Nipple—

Curtis Nipple Holders.....5%

Trace and Rein—

Fernald Double Trace Holder, ₩ doz. pairs $1.25
Dash Rein Holder, ₩ doz.....$1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50%; German.....33⅓%

Hooks—Cast—

Bird Cage, Reading.....50%
Clothes Line, Reading List.....50&5%
Coat and Hat Iron, Reading.....50%
Coat and Hat, Bronze Metal, Reading 33⅓%
Coat and Hat, Wrightsville.....60&5%
Harness, Reading List.....50%

Wire—

Belt, Nos. 1 to 15...80&5@80&10%
Wire C. & H. Hooks..80@80&10%
Parker Wire Goods Co., King..75&10%
Wire Goods Co.:
Acme, 60&10%; Chief, 75@75&10%; Crown, 75&10@80%; Czar, 70%; Capitol 80%; Czar Harness, 50&10%; Ceiling, 75@80%.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz., $6.20; Medium, $6.75; Heavy, $7.65
Grass, best, all sizes, **per doz.,** **$2.75@$3.00**
Grass, common grades, all sizes, per doz.....$1.25@$1.50
Hooks and Eyes:
Brass .....60@60&10%
Malleable Iron.....70@70&10%
Covert Mfg. Co. Gate and Scuttle Hooks 25%
Turner & Stanton Co. Cup and Shoulder .....85&10%
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Hose, Rubber—

Garden Hose, ¾-inch:
Competition .....ft. 6@6½¢
3-ply Guaranteed....ft. 8@8½¢
4-ply Guaranteed....ft. 9½@10¢
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 8@9¢
Fair Quality.....ft. 10@11¢

Irons— Sad—

From ¼ to 10.....lb. 3@3½¢
Mrs. Potts', cents per set:

	Nos. 50	55	60	65
Jap'd Caps	.86	.91	.96	.98
Tin'd Caps	.91	.88	1.01	.98

Bar and Corner—

Richards Mfg. Co., Bar, 60&10%; Corner 60%

Jacks, Wagons—

Covert Mfg. Co.:
Auto Screw.....30&10%; Steel, 50%
Lane's Steel.....30&5%
Richards' Tiger Steel, No. 150...50&10%

Ladder—

Richards Mfg. Co., Ladder Jacks..50%

Jointers—

Pike Mfg. Co., Saw Jointers, $7.00..40%

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%

Corn—

Columbian Cutlery Co., Wilcut Brand Knives and Hooks.....60%

Drawing—

Standard List.....80@—%
C. E. Jennings & Co., Nos. 45, 46, 25&7½%
Jennings & Griffin, Nos. 41, 42, 66⅔&7½%
Swan's .....66⅔@70%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge, per doz. $5.00@5.50
Iwan's Sickle Edge.....₩ doz. $9.00
Iwan's Serrated.....₩ doz. $9.50

Miscellaneous—

Farriers' .....doz. $2.40@$2.80

Knobs—

Base, 2½-inch, Birch or Maple, Rubber Tip.....gro. $1.25@1.40
Door, Mineral.....doz. 65@70¢
Door, Por. Jap'd.....doz. 70@75c
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door and Shutters.10%

Ladders, Store, &c.—

Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—

L. & G. Mfg. Co.'s list, Melting and Plumbers' 25%
P., S. & W.....40&10%
Reading .....50&10%

Lamps,—

Hammer's M. I. Hand.....45%

Lanterns—Tubular—

Regular, No. 0....doz. $4.00@4.50
Side Lift, No. 0...doz. $4.25@4.75
Hinge Globe, No. 0. doz. $4.25@4.75
Other Styles.....40&5%

Bull's Eye Police—

3-inch .....$3.75@4.00

Latches— Thumb—

Roggin's Latches, Jap'd, with Screws .....doz. 40¢

Door—

Cronk & Carrier Mfg. Co., No. 101, ₩ doz. $2.00
Richards' Bull Dog, Heavy, No. 125 .....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—

Small.....doz. 45¢; large, 55¢
Covert Mfg. Co.: Cotton, 55%; Hemp, 45%; Jute, 55%; Sisal, 45%.

Lifters, Transom—

Reading, Iron, 50&5%; Bronze Metal 33⅓%
R. & E.....10%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet	*$2.30*	*1.95*	*1.75*
75 feet	*$1.95*	*1.65*	*1.50*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....₩ gr. 30%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....30%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50 .....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....30%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines.....40%
Clothes Lines, White Cotton.....40%
Shade Cord, Cotton or Linen....30%

Locks— Cabinet—

Cabinet Locks....33⅓@33⅓@5%

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.

Reading Hardware Co.....33⅓
R. & E. Mfg. Co.....10%

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass .....75&10%

Sash, &c.—

Ives' Patent:
Crescent 25%
Automatic Gravity Metal Sash, ₩ gro. $149.58.....25%
Window Ventilating.....25%
Pullman Patent Ventilating Lock..25%
Reading Sash Locks, Iron.....50%
Reading Sash Locks, Bronze Metal 33⅓%

Machines—Boring—

Com. Upr't, without Augers. $2.00@2.25
Com. Angl'r, without Augers, $2.25@2.50
Ford Auger Bit Co.....$22.00
Jennings', Nos. 1 and 4.....25&7½%
Millers' Falls.....5.75
Snell's, Upright, $2.65; Angular, $2.90
Swan's Improved.....40&10%

Corking—

Reisinger Invincible Hand Power... ₩ doz. $48.00

Forming, Bending, Etc—

Royal Forming, Bending, Crimping and Fluting, Hand Power, each, $20.00.....10%

Hoisting—

Moore's Anti-Friction Chain Hoist.30%
Moore's Hand Hoist, with Lock Brake 20%
Moore's Cyclone High Speed Chain Hoist 25%

Ice Cutting—

Chandler's 12½%

Mallets—

Hickory .....45&5@50%
Lignumvitæ .....45&5@50%
Tinners' Hickory and Applewood .....doz. 45&5@50%

Mangers, Stable—

Swett Iron Works.....50%

Mats, Door—

Acme Flexible Steel.....50%
Elastic Steel (W. G. Co.), new list.50%
Everlasting Flexible Steel.....40%

Mills, Coffee, &c.—

Enterprise Mfg. Co.:
Coffee .....20@25%
Bone, Shell and Corn.....25&10%
Parker's Columbia and Victoria..33⅓%
Parker's Box and Side.....50&10%
Swift, Lane Bros. Co.....30%

Motors, Water—

Pike Mfg. Co., Tool and Knife Grinding 33⅓%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest, 10-in., $1.80; advance 10¢ for each size.
Cheap, 10-in., $2.50; advance, 10¢ for each size.
Better Grade, 10-in., $3.25; advance 25¢ for each size.

	12	*14*	*16*	*18 in.*
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*

Continental, High and Low Wheel, 50&10%
Great American.....66⅔%
Great American Ball Bearing....66⅔%
Quaker City.....66⅔%
Pennsylvania, High and Low Wheel, 50&10%
Pennsylvania, Jr., Ball Bearing 50&5%
Pennsylvania Golf, 6 Knives, Low Wheel, 33⅓%; High Wheel.....45%
Pennsylvania Golf, Ball Bearing, 7 Knives, High Wheel.....33⅓%
Pennsylvania Horse, 30 and 38 inch, 33⅓&5%
Pennsylvania Pony or Two Man.40&5%
Pennsylvania Grand Horse, 30 and 38 in.....33⅓%

Nails—

Wire Nails and Brads, Miscellaneous .....85&10%
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers', &c. See *Tacks.*

Horse—

Jobbers' Special Brands, per lb. 9¢

Picture—

	1½	*2*	*2½*	*3 in.*
Brass Hd. gro.	*.45*	*.55*	*.60*	*.70*
Por. Head, gro., all sizes				*.80¢*

Upholsters—

Brass 30%
Plated .....30&10%

Nuts— *Blank or Tapped.*

Cold Punched:	*Off list.*
Square	*5.10¢*
Hexagon	*5.70¢*
Square, C., T. & R.	*5.50¢*
Hexagon, C., T. & R.	*6.30¢*
Hot Pressed:	*Off list.*
Square	*5.50@5.60¢*
Hexagon	*5.90@6.00¢*

Oakum—

Best .....lb. 6½¢
U. S. Navy.....lb. 6 ¢
Navy .....lb. 5 ¢
Plumbers' Spun Oakum..2¾@3 ¢

Oil—

Pike Mfg. Co., Stonoil.....40%

Oil Tanks—See *Tanks, Oil.*

Oilers—

Steel, Copper Plated.....75&10%
Chase or Paragon:
Brass and Copper.....45&50%
Zinc .....65&10@70%
Railroad .....60&10&10%
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%
Hero Fruit Jar Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, etc.....60@60&10%
Malleable, Hammers' Improved, Nos. 11, 12 and 13, 10%; Old Pattern, Nos. 1, 2, 3, 4, 50%.
Maple City Mfg. Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers, Can—

Triumph Shear Can Openers, doz..$1, 1

Egg—

Hartigan Nickel Plate, ₩ doz., $2.50; Silver Plate, $4.00.

Packing—

Asbestos Packing, Wick and Rope, any quantity.....13¢

Rubber—

(Fair quality goods.)
Sheet, C. I.....11@12¢
Sheet, C. O. S.....11@12¢
Sheet, C. B. S.....12@13¢
Sheet, Pure Gum.....40@45¢
Sheet, Red.....40@50¢
Jenkins' '96, ₩ lb., 80¢.....25%

Miscellaneous—

American Packing....lb. 7@10 ¢
Cotton Packing.....lb. 16@25 ¢
Italian Packing.....lb. 9@10¢
Jute .....lb. 4@4¼¢
Russia Packing.....lb. 9@10¢

Pails, Galvanized—

Net, per dozen.

Quarts..	8	10	12	14	16
Light	*$1.45*	*1.65*	*1.80*	*2.00*	*2.35*
Ex. heavy.	*...*	*$2.65*	*2.85*	*3.00*	*3.35*
Rd. Bottom Fire Pails	*...*	*1.95*	*2.10*	*2.30*	*...*
Well Pails	*1.95*	*2.15*	*2.35*	*...*	*...*

Paint—

Dixon's Silica-Graphite, in 1 gal. pails and 5 gal. kegs, 25%; packages of larger size.....20%

Pans— Dripping—

Standard List.....75&10&5%

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz.	*$2.00*	*2.25*	*2.50*	*2.75*

Paper—Building Paper

Per roll.
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll..38¢
Medium weight, 30 lbs. to roll, 45¢
Heavy weight, 40 lbs. to roll..60¢
Black Water Proof Sheathing, 500 sq. ft., light weight, 65¢; medium weight, 95¢; heavy weight, $1.30.
Deafening Felt, 9 and 6 sq. ft. to lb., ton.....$40.00
Red Rope Roofing, 250 sq. ft. per roll.....$1.75

Tarred Paper—

1 ply (roll 400 sq. ft.), ton, carloads, $31.00; less than carloads $32.00
2 ply, (roll 108 sq. ft.), 40 lb..48¢
3 ply (roll 108 sq. ft.), 60 lb..68¢
Slater's Felt (roll 500 sq. ft.), per ton, $35.00; per roll.....70¢

Sand Paper and Cloth—

Flint and Emery.....50&10%
Garnet Paper and Cloth.....25%

Parers—Apple—

Goodell Co.:
Family Bay State.....₩ doz. $15.00
Improved Bay State.....₩ doz. $36.00
New Lightning.....₩ doz. $7.00
Turn Table '98.....₩ doz. $6.00
White Mountain.....₩ doz. $5.00
Bonanza Improved.....each $7.50
Dandy .....each $10.00
New Century.....each $20.00
Ranger .....each $25.00
Rapid Apple Slicer.....each $100.00
Reading Hardware Co.:
Advance .....₩ doz. $4.00
Baldwin .....₩ doz. $4.00
Reading 72.....₩ doz. $3.25
Reading 78.....₩ doz. $6.25

Orange—

Goodell Co., Success.....each $20.00

Potato—

Saratoga .....₩ doz. $7.00
White Mountain.....₩ doz. $6.00

Picks and Mattocks—

List 75%

Cronk's Handled Garden Mattock, ₱ doz., $6.09.....33⅓%

Pins, Escutcheon—

Brass .....50@50&10%
Iron .....60@60&10%

Pipe, Cast Iron Soil—

Eastern Prices:
Standard, 2-6 in......68%
Extra Heavy, 2-6 in.....74%
Fittings, Standard and Heavy 80¾%
Extra, 10 & 10&5%

Pipe, Merchant—

	Carloads to Consumers: Steel. Blk. %	Iron. Galv. %	Blk. %	Galv. %
⅛ *and ¼ in..*				
⅜ *in.....*				
½ *in.....*	*See Trade Report*			
¾ *to 6 in....*				
7 to 12 in....				

Pipe, Vitrified Sewer—

Carload lots.
Standard Pipe and Fittings, 8 to 24 in., f.o.b. factory:
First-class 85%
Second-class 87%

Pipe, Stove—

	Per 100 joints. C. L.	L. C. L.
Wheeling Corrugating Co.'s Nested		
5 in., Uniform Color..	$5.90	$6.90
6 in., Uniform Color..	6.40	7.40
7 in., Uniform Color..	7.40	8.40

Planes and Plane Irons—

Wood Planes—

Bench, first qual.....30@30&5%
Bench, second qual....40@40&5%
Molding .....25@25&5%

Chapin-Stephens Co.:
Bench, First Quality.....30%
Bench, Second Quality.....40%
Molding and Miscellaneous.....25%
Toy and German.....30%
Union 60%

Iron Planes

Union 60%

Plane Irons—

Wood Bench Plane Irons....25%

Buck Bros.....30%
Chapin-Stephens Co.....25%
Union 50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—

Kohler's Eclipse.....₱ doz. $7.50

Plates—

Felloe .....*lb.* 3¾@4¢

Avery Stamping Co.:
Standard Wrot, Steel Felloe Plates in 100 lb kegs, per 100 lb, ¾-in. to 1¼-in., $4.00 net; 1¼-in. to 2-in., inclusive, $3.75 net.

Steel Pipe Hook—

Never-Break .....75&10%

Pliers and Nippers

Button Pliers.....75&5@75&10%
Gas Burner, per doz., 5 in., $1.25 @$1.30; 6 in., $1.45, $1.50.

Gas pipe..	7	8	10	12-in.
	$2.00	$2.25	$2.75	$3.50

Acme Nippers.....50%
Cronk & Carrier Mfg. Co.:
American Button.....80%
Improved Button.....75&10%
Cronk's 60%
No. 80 Linemen's.....50%
Stub's Pattern.....45%
Combination and others.....33⅓%
Elmore Tool Mfg. Co.:
Gas Pliers.....70%
Wire and Cutting Pliers.....75%
Heller's Farriers' Nippers, Pincers and Tools.....40@40&10%
P., S. & W. Tinners' Cutting Nippers 20%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds....40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10%
Chapin's Imp. Brass Cor..40@40&10%
Pocket Levels.....30@30&10%
Extension Sights.....30@30&10%
Machinists' Levels.....40@40&10%
Disston & Sons:
Shafting Levels .....60&10%
Pocket Levels.....60&10%
Plumbs and Levels.....60&10%
Track Level and Gauge.....60&10%

Points, Glaziers'—

Bulk and 1-lb. papers.....*lb.* 10¢
¼-lb. papers.....*lb.* 11¢
¼-lb. papers.....*lb.* 12¢

Police Goods—

Manufacturers' Lists...25@25&5%

Polish—Metal, Etc—

Ladd Co.:
Putzade Liquid, ₱ gro., ⅛ pts., $12.00; 1 pts., $20.00; 1 qts., $40.00; ₱ doz., ½ gals., $6.35; 1 gals., $12.00.
Prestoline Liquid, No. 1 (¼ pt.), ₱ doz., $3.00; No. 2 (1 qu.), $5.00..40%
Prestoline Paste.....40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₱ doz. 50¢; ₱ gro. $4.50; ½ lb boxes, ₱ doz. $1.25; 1 lb boxes, ₱ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₱ doz., $1.25.
Barkeepers' Friend Metal Polish, ₱ doz., $1.75.

Stove—

Black Eagle Benzine Paste, 5 lb cans, ₱ lb 10¢
Black Eagle, Liquid, ½ pt. cans.. ₱ doz. 75¢
Black Jack Paste, ¾ lb cans, ₱ gr. $9.00
Black Kid Paste, 5 lb can...each, $0.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon, ₱ gr. $5.75.....10%
Dixon's Plumbago.....₱ lb 8¢
Fireside .....₱ gr. $2.50
Gem, ₱ gr. $4.50.....10%
Japanese .....₱ gr. $3.50
Jet Black.....₱ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ₱ doz. $1.50

Window Polish—

Benj. P. Forbes:
Glasbright, 1 lb cans, each.....75¢
Glasbright, Factory, 10 lb pails, ₱ lb.....25¢

Peppers, Corn—

1 qt. Square..doz. $0.75; gro. $8.75
1 qt. Round..doz. $0.90; gro. $10.00
1½ qt. Square. doz. $1.20; gro. $12.00
2 qt. Square..doz. $1.50; gro. $15.00

Pots, Glue—

Enameled .....30&10%
Tinned .....30&5%

Powder—

Black Sporting:
Kegs (25 lb.)..$5.00@5.50
Half Kegs (12½ lb.), $2.75@3.00
Quarter Kegs (6¼ lb.), $1.50@1.65
Canisters, pounds... .25
Canisters, ½ pounds. .15
Canisters, ¼ pounds. .12
Discount to the trade, 10%.
NOTE.—Prices vary according to territory.

Presses—

Enterprise Mfg. Co., Fruit, Wine and Jelly.....20@25%
Lard Presses and Sausage Stuffers .....25@25&7½%

Seal Presses—

Morrill's No. 1, ₱ doz., $20.00.....50%
Morrill's Pocket, $20.00.....50%

Pruning Hooks and Shears

See *Shears.*

Pullers, Nail, Etc.—

Elmore Tool Mfg. Co.:
Drop Forged Tack Claws....50&10%
Standard Tack Claws, No. 10 33⅓&7½%
Nail Pullers.....40%
Miller's Falls, No. 3, ₱ doz., $12.00.. 33⅓&10%
Morrill's No. 1, Nail Puller, ₱ doz. $20.00 .....50%
Pearson Spike Puller, each, $15.00..25%
Parrot Tack and Stub Pullers, ₱ doz. $1.20
The Scranton Co. Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00

Pulleys, Single Wheel—

Inch	1½	1¾	2	3
Awning or Tackle, doz.	$0.50	.45	.60	1.05
Hay Fork, Swivel or Solid Eye, doz., ¼ in., $1.25; 5 in., $1.55				
Inch	2	2¼	2½	
Hot House, doz...	$0.65	.85	1.20	
Inch	1¼	1½	1¾	2
Screw, doz....	$0.16	.19	.23	.30
Inch	1¾	2	2¼	2½
Side, doz.....	$0.25	.40	.55	.60
Inch	1½	1¾	2	2½

Sash Pulleys—

Common Frame; Square or Round End, per doz., 1¾ and 2 in.....*17@20¢*
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in. .20@21¢
Acme, No. 35..1¾ in., 19¢; 2 in., 20½¢
American Pulley Co.:
Wrought Steel American Plain Axle .....50&10%
Wrought Steel, Eagle, ₱ doz., 1¾ in., 17¢; 2 in., 20¢; 2¼ in., ...27¢
Top Notch, Electrically Welded, Nos. 3 and 4, ₱ doz.....19¢
Common Sense.....₱ doz. 20¢
Merit, ₱ doz., 2¼ in.....37¢
Fox-All-Steel, Nos. 3 and 7, 2 in..... ₱ doz. 50%
Grand Rapids All Steel Noiseless..50%
Niagara, No. 25, 1¾ in., 19¢; 2 in. .....20½¢
No. 26 Troy..1¾ in., 14½¢; 2 in., 16½¢
Star, No. 26....1¾ in., 19¢; 2 in., 20½¢
Tackle Blocks—See Blocks.

Pumps—

Cistern 60%
Pitcher Spout.....75¢&10&5@80
Wood Pumps, Tubing, &c....50%
Barnes Mfg. Co.:
Dbl. Acting (low list).....50%
Pitcher Spout.....80%
Daisy Spray Pump.....₱ doz. $6.50
Goulds Mfg. Co.:
Double-Acting Thresher Tank.. $5.00
Diaphragm No. 3, Side Suction.$14.50
Empire, Advance, Seneca, D. A. Shallow and Deep Well (low list) 50%
Spraying and Whitewashing.....$2.45
F. E. Myers & Bros. (low lists):
Double Acting Force and Lift; Cistern and Well; House; Windmill; Ratchet Handle; Pump Stands; Hydro-Pneumatic; Bulldozer Power; Spray; Ashland Force and Lift.....50%
Thresher Tank—Myers and Faultless Low Down Tank.....$5.90
Century Low Down Tank, No. 470 .....$5.25
Century Low Down Ratchet Handle Tank, No. R470.....$5.50

Pump Attachments—

Chicago Hdw. & Fdy. Pump Spout Attachments, each.....$0.27

Pump Leathers—

Plunger and Valve Leathers—Per gro.:

No.....	*1*	*2*	*3*	*4*
	$5.00	*6.00*	*7.00*	*8.00*

Cup Leathers—Per 100:

Inch....	*2½*	*3*	*3½*	*4*
	$5.00	*7.00*	*9.00*	*12.00*

30@30&5%

Punches—

Saddlers' or Drive, good, doz. .60@75¢
Spring, single tube, good quality *$1.75*
Revolving (¼ tubes)....doz. $3.50
Bemis & Call Co.'s Cast St'l Drive.50%
Elmore Tool Mfg. Co.:
Machinists' Center.....40%
Tinners': Solid, 50%; Prick.....50%
Morrill's Nos. 1AA, 1A, 1B, 1C, 1D, $15.00.....50%
Hercules, 1 die, each $5.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55%
Tinners' Hollow, P., S. & W. Co..25%
Tinners' Solid, P., S. & W. Co., ₱ doz., $1.44.....40&10%

Rail—Barn Door, &c.—

Sliding Door, Painted Iron, 2½@2¾¢
Sliding Door, Wrought Brass, 1⅛ in., lb., 36¢.....30%
Cronk's:
Double Braced Steel Rail..₱ ft. 2¾¢
O. N. T. Rail.....2½¢
Griffin's:
xxx, ₱ 100 ft., 1 x 3-16 in., $3.25; 1¼ x 3-16 in., $3.75.
Hinged Hanger, ₱ 100 ft., 1 x 3-16 in., $3.50; 1¼ x 3-16 in., $4.00.
Lane's:
Hinged Track, ₱ 100 ft.....$3.45
O. N. T., ₱ 100 ft., 1 in., $3.12½; 1¼ in., $3.45; 1½ in., $4.00.
Standard, 1¼ in.....₱ 100 ft. $4.00
Lawrence Bros.:
1 x 3-16 in., ₱ 100 ft., $7.50; 1¼ x 3-16 in., $8.75.....55&7½%
Trolley, No. 301, ₱ ft.....9¢
McKinney's:
Hinged Hanger Track, ₱ ft., 11¢. 60&5%
1 x 3-16 Track.....55&7½%
Myers' Stayon Track.....60&10%
Richards Mfg. Co.:
Common, 1 x 3-16 in., $3.00; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail..60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, ₱ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 50.....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.

Rakes—

Cronk's:
Steel Garden: Champion, ₱ doz., 12-tooth, $3.75; 14-tooth, $4.00; 16-tooth, $4.25; Ideal ₱ doz., 12-tooth, $3.00; 14-tooth, $3.30; 16-tooth, $3.60.
Victor, 12-tooth, $2.25; 14-tooth, $2.50; 16-tooth, $2.75.
Queen City Lawn, ₱ doz., 20 teeth, $2.35; 24, $2.50.....net
Anticlog Lawn, ₱ doz.....$3.50
Malleable Garden.....70&10%
Ideal Steel Garden, ₱ doz., 12 teeth, $13.00; 14, $16.00; 16, $18.00.....80%
Kohler's:
Jumbo Lawn, 36-tooth....₱ doz. $5.00
Lawn Queen, 20-tooth....₱ doz. $2.65
Lawn Queen, 24-tooth....₱ doz. $2.75
Paragon, 20-tooth.....₱ doz. $2.40
Paragon, 24-tooth.....₱ doz. $2.50
Steel Garden, 14-tooth....₱ doz. $2.40
Malleable Garden, 14-tooth, ₱ doz. $1.75@2.00

Rasps, Horse—

Disston's 75%
Heller Bros.'.....70&5@70&10&5%
Liveright Bros.' Gold Medal.....70%
McCaffrey's American Standard..... 60&10&5%
New Nicholson.....70&10@75%
See also Files.

Razors—

W. H. Compton Shear Co.....30%

Reels, Fishing—

Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo., Nickeled Populo.....20%
Aluminum, German Silv., Bronze,25%
1240 N, 124 N.....20%
3004 N, 06 N, 6 RM, G 9.....25%
4 N, 6 PN, 24 N, 26 PN.....20%
2904 P., 33⅓%; 2904 PN., 33⅓%; 0924 N., 33⅓%; 02084 N., 33⅓%; 002904 PN., 33⅓%; 802 N., 33⅓%; 986 PN, 2904 N, 974 PN.....25%
5009 PN, 5009 N.....20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—

Japanned, Electroplated and Bronzed 70%
White Porcelain Enamel..50&10%
Solid Brass or Bronze Metal.40%

Revolvers—

Single Action.....*95¢@$1.00*
Double Action, except 44 cal. $2.00
Double Action, 44 caliber...$2.00
Automatic *$4.00*
Hammerless *$4.50*

Riddles, Hardware Grade

16 in.....per doz. $2.50@$2.75
17 in.....per doz. $2.75@$3.00
18 in.....per doz. $3.00@$3.25

Rings and Ringers—

Bull Rings—

	1	*1¼*	*3 inch.*
Steel	*$0.70*	*0.75*	*0.80 doz.*
Copper	*$1.10*	*1.25*	*1.65 doz.*

Hog Rings and Ringers—

Hill's Rings, per gro. boxes, $4.60@$4.75; per doz. boxes 40@45¢
Hill's Ringers, Gray Iron, doz., 55@65¢
Hill's Ringers, Malleable Iron, doz. 85@95¢
Blair's Rings..per gro. $5.50@$6.00
Blair's Ringers..per doz. 65@70¢

Rivets—

Copper Rivets and Burrs, 50@50&10%
Tinners' and Miscellaneous Rivets 80%
Structural, base.....2.15¢
Boiler, base.....2.25¢

Bifurcated and Tubular—

Assorted in Pasteboard Boxes.
Bifurcated, per dozen boxes, 50 count, 40@45¢; 100 count, 50@ 65¢.
Tubular, per doz. boxes, 50 count, 60@68¢; 100 count, $1.12@$1.26.

Rollers—

Cronk's Stay, No. 50.....$1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56, $0.75; No. 60.....$0.75
Lane's Stay.....40%
Myers' Stay.....60%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 58.50¢
Lag Screw, Nos. 55 and 57.....50%
Underwriters', Nos. 59, 60.....50%
Favorite, No. 54.....60%

Rope—

Manila, 7-16 in. diam. and larger: Highest Grade.....lb. 8¼@8½¢ Lower Grades.
Sisal, 7-16 in. diam. and larger: Highest Grade.....lb. 7½@7¾¢ Commercial Grade.....lb. 6½¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Pure .....*lb.* 7¾@8¢
Sisal, Tarred, Medium Lath Yarn: Pure .....*lb.* 6¾@7¢
Cotton Rope: Best, ¼-in. and larger..18@22¢ Medium, ¼-in. and larger. 16½¢ Common, ¼-in. and larger..7½¢ In coils, ½¢ advance.
Jute Rope: Rope, No. 1, ¼-in. and up. lb. .....5@5½¢

Wire Rope—

Galvanized .....47½&2½%
Plain .....55&2½%

Ropes, Hammock—

Covert Mfg. Co.:
Jute, $0.75@$0.83; Sisal....$0.82@$0.90

Rules

Boxwood ..... 60&5%
Ivory ..... 25&5%

Chapin-Stephens Co.:
Boxwood 60%
Flexifold 40%
Ivory ..... 25@25&10%
Miscellaneous ..... 50@50&10%
Stephens' Combination 55%
Stationers' ..... 50@50&10%

Keuffel & Esser Co.:
Folding, Wood ..... 35&10%
Folding, Steel ..... 33⅓&13%

Lufkin's Steel ..... 50&10%
Lufkin's Lumber ..... 50&10%
Upson Nut Co.:
Upson Nut Co., Boxwood ..... 60&5%

Saws—

Atkins':
Circular 45%
Band ..... 50@50&10%
Butcher Saws 50%
Cross Cuts 35%
One-Man Cross Cut 40%
Narrow Cross Cut 50%
Hand, Rip and Panel ..... 35&5%
Miter Box and Compass 40%
Mulay, Mill and Drag 45%
Wood Saws ..... 40&10%

Chapin-Stephens Co.:
Turning Saws and Frames ..... 30@30&10%

Disston's:
Circular, Solid and Ins'ted Tooth 50%
Band, 2 to 18 in. wide 60%
Band, ¾ to 1¾ 60%
Crosscuts 45%
Narrow Crosscuts 50%
Mulay, Mill and Drag 40%
Framed Woodsaws 25%
Woodsaw Blades 25%
Woodsaw Rods, Tinned 15%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c 25%
Hand Ice Saws 45%
Butcher Saws and Blades 30%

C. E. Jennings & Co.'s:
Back Saws 16⅔%
Butcher Saws ..... 25&7½%
Compass and Key Hole Saws, 33⅓&7½%
Framed Wood Saws ..... 25&7½%
Hand Saws 12½%
Wood Saw Blades ..... 33⅓&7½%

Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%

Massachusetts Saw Works:
Victor Kitchen Saws ..... 40&10&50%
Butcher Saws Blades ..... 35@40%

Peace & Richardson's Hand Saws 30%

Simonds':
Circular Saws 45%
Crescent Ground Cross Cut Saws 30%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws 40%
Band Saws 50%
Back Saws ..... 25@25&7½%
Butcher Saws ..... 35@35&7½%
Hand Saws ..... 25@25&7½%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c. 25@25&7½%
Wood Saws ..... 40&7½%

Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws 50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A 40%
Disston's:
Concave Blades 25%
Chromol Blades 35%
Hack Saw Frames 30%

Simonds, 35%; Bay State, 40%; Culley 35%

C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180 ..... 40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%

Goodell's Hack Saw Blades ..... 40&10%
Griffin's Hack Saw Frames ..... 35&5&10%
Griffin's Hack Saw Blades ..... 35&5&10%
Griffin Co. Hack Saw Blades 50%
Star Hack Saws and Blades ..... 15&10%
Sterling Hack Saw Blades ..... 30&10&5%
Sterling Hack Saw Frames ..... 30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00 ..... 10%
Victor Hack Saw Blades 20%
Victor Hack Saw Frames 40%
Victor Hack Saw Machines, each $75.00

Scroll—

Barnes, No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20 ..... 20%
Lester, complete, $10.00 ..... 15&10%
Rogers, complete, $3.50 and $4.00 ..... 15&10%

Scales—

Union Platform, Plain ..... $2.10@2.20
Union Platform, Stpd ..... $2.20@2.30

Chatillon's:
Eureka 25%
Favorite 40%
Grocers' Trip Scales 50%

Reading Hardware Co. ..... 50&5%
The Standard Portables 40%
The Standard R. R. and Wag- ...

Scrapers—

Chapin-Stephens Co., Box ..... 30@30&10%
Richards Mfg. Co., Foot 60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1¼, $3.00@3.25; 1½, $3.50@3.75
Bench, Wood ..... 20@20&10%
Hand, Wood ..... 70&10@70&10&10%
Chapin-Stephens Co., Hand ..... 70@70&10&2½%

Coach, Lag and Hand Rail—

Lag, Cone Point ..... 75&10%
Coach, Gimlet Point ..... 75&5%
Hand Rail ..... 70&10@75%

Jack Screws—

Standard List ..... 70&10@75%
Millers Falls ..... 50&10&10%

Machine—

Cut Tread, Iron, Brass or Bronze:
Flat Head or Round Head, ... 50@50&10%
Fillister Head ..... 40@40&10%
Rolled Thread, F. H. or R. H., Iron ..... 75&10%
F. H. or R. H., Brass, Nos. 8 to 14 ..... 65&10%

Set and Cap—

Set (Iron) ..... 75&10&7½%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap ..... 70&10&7½%
Hex. Hd. Cap ..... 70&10&7½%
Rd. Hd. Cap ..... 50&7½%
Fillister Hd. Cap ..... 60&7½%

Wood—

List July 23, 1903.

Flat Head, Iron ..... 87½&5@..%
Round Head, Iron ..... 85&5@..%
Flat Head, Brass ..... 80&5@..%
Round Head, Brass ..... 77½&5@..%
Flat Head, Bronze ..... 75&5@..%
Round Head, Bronze ..... 72½&5@..%
Drive Screws ..... 87½&5@..%

Scythes— *Per doz.*

Plain Grass, Cutting Edge Polished ..... $6.25@$6.50
Clipper, Bronzed Web ..... $6.50@$6.75
Solid Steel, Web and Backs Polished ..... $7.00@$7.25
Bush, Weed and Bramble, Painted ..... $6.50@$6.75
Grain, Painted, Cutting Edge Polished ..... $8.25@$8.50
Clipper Grain, Bronze Web ..... $8.50@$8.75

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Fray's Hollow Tool Handles, Nos. 1, $12; 2, $16; 3, $12 ..... 50%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18 ..... 20&10%

Sets, Nail—

Octagon ..... *gro. $3.50@3.75*
Buck Bros. 27½%
Elmore Tool Mfg. Co. 30%
Mayhew's ..... ₱ gro. $9.00
Snell's Corrugated, Cup Pt. ..... 40&10%
Snell's Knurled, Cup Pt. ..... 40&10%
Victor Knurled, Cup Pt. ..... ₱ gro. $7.50

Rivet—

Regular list ..... 75@75&10%

Saw—

Atkin's:
Criterion 40%
Adjustable 40%
Disston's Star, Monarch and Triumph 30%
Giant Royal Cross Cut ..... ₱ doz. $6.00
Morrill's No. 1 ..... $15.00
Nos. 3 and 4, Cross Cut $20.60
No. 5, Mill $30.00
Nos. 10, 11, 95 ..... $15.60
No. 1 Old Style $10.00
Special $16.25
Royal, Hand ..... ₱ doz. $3.50
Seymour Smith & Son's 65%
Taintor Positive ..... ₱ doz. $6.75

Sharpeners, Knife—

Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ₱ doz. $1.50
Mounted Kitchen Sand Stone, ₱ doz. $1.50
Natural Grit Carving Knife Hones, ₱ doz. $3.00
Quick Cut Emery Carving Knife Hones, ₱ doz. $1.50
Quick Edge Pocket Knife Hones, ₱ doz. $2.50

Lawn Mower—

Pike Mfg. Co., 12, 14, 16, 18 and 20 in., doz. $6.00 ..... 33⅓%

Shavers, Beef—

Enterprise Mfg. Co. ..... 25@30%

Shaves, Spoke—

Iron ..... *doz. $1.25*
Wood ..... *doz. $2.00*
Chapin-Stephens Co. ..... 30@30&10%
Millers Falls Co., ₱ doz., $9.00 ..... 15&10%
Seymour Smith & Son's 50%

Shears—

	7	8	9 in.	
Cast Iron				
Best	$16.00	18.00	20.00	gro.
Good	$13.00	15.00	17.00	gro.
Cheap	$5.00	6.00	7.00	gro.

Straight Trimmers, &c.:
Best quality Jap ..... 70&10&5%
Best Quality Nickel ..... 60&10&5%
Tailors' Shears ..... 40@40&10%
Acme Cast Shears 40%
Columbian Cutlery Co.:
Sheep, 1900 list ..... 30&10&5%
Grass ..... 50&10%
Horse or Mule ..... 50&10%
W. H. Compton Shear Co.:
Japan Handles, Nickel Blades, ... 60&10&5%
Full Nickel ..... 50&10&5%
Tailors' 30%
J. Wiss & Sons Co.:
Best Quality Jap'd ..... 60&10%
Best Quality Nickeled ..... 50&10%
Tailors' 25%

Tinners' Snips—

Steel Blades ..... 20&5@20&10%
Steel Laid Blades ..... 50&10%
Acme Cast Snips 40%
W. H. Compton Shear Co., Forged Steel Handles 35%
Jennings & Griffin Mfg. Co.'s 6½ to 10 in. ..... 33⅓&7½%
Niagara Snips 40%
P., S. & W. Forged Handles 25%
Forged Handles, Steel Blades, Samson ..... 40@40&5%
Triumph Stove Pipe, doz. $6.00
J. Wiss & Sons Co.:
Wiss Forged Steel 25%

Pruning Shears—

Columbian Cutlery Co.:
Hedge, Wilcut Brand ..... 60&10%
Lawn and Border, Wilcut Brand, ... 60&10%
W. H. Compton Shear Co., Dropped Forged Steel 35%
Cronk's Hand Shears 33⅓%
Cronk's Wood Handle Shears 33⅓%
Disston's Combined Pruning Hook and Saw, ₱ doz, $18.00 ..... 25%
Disston's Pruning Hook only, ₱ doz., $12.00 ..... 25%
J. T. Henry Mfg. Co.:
Pruning Shears, all grades 40%
P., S. & W. Co. 40%
Seymour Smith & Son's:
Hand Shears 70%
Standard Tree Pruners ..... 75&10%
Wood Handle Pruning Shears 40%

Sheaves— Sliding Door—

Reading 40%
R. & E. list 15%

Sliding Shutter—

Reading list 40%
R. & E. list 15%

Shells—Empty—

Brass Shells, Empty:
Climax, 10 and 12 gauge ..... 60&5%
Club, Rival, 65&5%; First Quality, ... 60&5%
Paper Shells, Empty:
New Rapid, 10, 12, 16 and 20 gauge, ... 60%
Climax, 10 and 12 gauge; Amateur grade 60%
10, 12, 16 and 20 gauge; Repeater grade 60%
New Club, 10 and 12 gauge, Rival Grade 60%
New Climax, Defiance, 10, 12, 14, 16 and 20 gauge; Climax, 14, 16 and 20 gauge 20%
Nitro Club, 10, 12, 16 and 20 gauge; New Club, 14, 16 and 20 gauge; Repeater Grade 20%

Shells, Loaded—

Loaded with Black Powder 40%
Loaded with Smokeless Powder, medium grade ..... 40&5%
Loaded with Smokeless Powder, high grade ..... 40&10&10%
Union Metallic Cartridge Co.:
New Club, Black Powders 40%
Nitro Club, Smokeless Powders ..... 40&5%
Arrow, Smokeless Powders ..... 40&10&10%
Winchester:
Smokeless Repeater Grade ..... 40&5%
Smokeless Leader Grade ..... 40&10&10%
Black Powder 40%

Shingles, Metal— Per Sq.

Wheeling Corrugating Co.:
Dixie, 14 x 20 in. $4.05 $5.05
Dixie, 10 x 14 in. 4.25 5.45
Dixie, 7 x 10 in. 5.25 6.70

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... *per keg $4.10*
Steel ..... *per keg $3.85*
Burden's, all sizes ..... ₱ keg $3.90

Shot—

	25-lb. bag.
Drop, up to B	$1.70
Drop, B and larger	1.95
Buck	1.95
Chilled	1.85
Dust	2.50

Shovels and Spades—

Association List ..... 40&7½%@40&10%
Avery Stamping Co. 40%

Snow Shovels—

Long Handle ..... $2.50@$2.75
Wood and Mall, D Handle, ... $2.65@$2.90

Sieves and Sifters—

Hunter's Imitation, gro. $9.50
Hunter's Genuine, per gro. $12.00

Sieves, Seamless Metallic

	Per dozen.			
Mesh	1½	16	18	20
Iron Wire	$1.05	1.05	1.10	1.20
Tinned Wire	$1.15	1.15	1.20	1.30

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested ..... *doz. $0.90@0.95*
Mesh 20, Nested ..... *doz. $1.00@1.05*
Mesh 24, Nested ..... *doz. $1.30@1.40*

Sinks, Cast Iron—

Painted, Standard list:
12 x 12 to 22 x 36 in. 60%
20 x 24 to 24 x 50 in. 50%
24 x 60 to 24 x 120 in. 30%
Barnes' low list, all sizes up to 20 x 40, 60%; larger sizes 55%

NOTE.—There is not entire uniformity in lists used by jobbers.

Steel—

Steel Sinks, L. & G. list 60%

Skeins, Wagon—

Cast Iron ..... 70@70&10%
Steel ..... 35@40%

Slates, School—

Factory Shipments.
"D" Slates ..... 50@50&10%
Eureka, Unexcelled Noiseless ..... 60&7 tens.
Victor A, Noiseless ..... 60&4 tens &5%

Sleds—

Little Giant Folding, ₱ doz. $12.00

Snaps, Harness—

German ..... 40@40&10%
Covert Mfg. Co.:
Polo, King ..... 25&10%
High Grade, Covert, Trojan ..... 30&10&10%
Yankee, Queen, Yankee Roller ..... 30&10%

Snaths—

Grass Scythe ..... 50@50&5%

Spoons and Forks—

Silver Plated—

Good Quality ..... 50&10@60&5%
Cheap ..... 60@60&10%
International Silver Co:
1847 Rogers Bros. ..... 40&10%
Rogers & Bro., William Rogers' Eagle Brand ..... 50&10%
Anchor, Rogers Brand 60%
Wm. Rogers & Son ..... 60&10%

Miscellaneous

German Silver ..... 60@60&5%

Tinned Iron—

Teas ..... *per gro. 50@55¢*
Tables ..... *per gro. $0.90@$1.00*

Springs— Door—

Bardsley's Spring and Check 33⅓%
Chicago (Coil) ..... 40&10%
Pullman Door (Coil), ₱ gro. $10.00
Pullman Gate 10%
Reliance (Coil) ..... 40&10%

Carriage, Wagon, &c.—

	Per 100 lb.
1¼ in. and Wider:	
Black	$4.75@$5.00
Half Bright	$4.75@$5.00
Bright	$5.25@$5.50

Painted Seat Springs:
1½ x 2 x 26 ..... *per pair, 45@47¢*
1½ x 3 x 28 ..... *per pair, 68@71¢*

Sprinklers, Lawn—

Enterprise ..... 25@30%
Hero Fruit Jar Co., ₱ doz. $4.50
Philadelphia No. 1, ₱ doz. $12; No. 2, $15; No. 3, $20 ..... 30%

Squares—

Nickel plated } *New List, See*
Steel and Iron } *Trade Report.*
Rosewood Hdl. Try Square and T-Bevels ..... 60&10&10@70%
Iron Hdl. Try Squares and T-Bevels ..... 40&10@40&10&10%
Disston's Try Squares and Bevels, ... 60&10%

Squeezers, Lemon

Wood, Porcelain Lined:
Cheap ..... *doz. $1.00*
Good Grade ..... *doz. $1.25*
Tinned Iron ..... *doz. $0.75@$1.00*
Iron, Porcelain Lined ..... *doz. $1.75*
Victor, ₱ gro. $9.00

Staples—

Barbed Blind ..... 85&5@85&10%
Electricians' ..... 80&10&10@85%
Fence Staples, Polished, $1.80:
Galvanized *$2.10*
Poultry Netting Staples ..... *per lb. 3½@3½¢*

Steels, Butchers'—

Dick's 30%
Foster Bros. 35%

Steelyards— ..... 20@30&10%

Stocks and Dies—

Blacksmiths' .....50@50&10%
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates.....25%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plate.....25%

Stoners, Cherry—

Enterprise .....25@30%

Stones, Axe—

Pike Mfg. Co., Axe Stones (all kinds) 33⅓%

Glass Cutters' Stones—

Pike Mfg. Co., Glass Cutters' Stones and Supplies.....40%

Stones, Oil, &c.—

Pike Mfg. Co., 1907 list; ₱ lb
Arkansas St. No. 1, 3 to 5½ in.$2.80
Arkansas St. No. 1, 5½ to 8 in.$3.50
Arkansas Slips No. 1.....$1.00
Lily White Washita, 4 to 8 in.60¢
Rosy Red Washita, 4 to 8 in..60¢
Washita St., Extra, 4 to 8 in..50¢
Washita St., No. 1, 4 to 8 in..40¢
Washita St., No. 2, 4 to 8 in..25¢
Lily White Slips.....90¢
Rosy Red Slips.....90¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
Washita Slips, No. 2.....40¢
India Oil Stones (entire list)...33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit.....40%
Quickcut Emery and Corundum Axe Stone, Double Grit.....33⅓%
Quickcut Emery Rubbing Bricks..40%
Hindostan No. 1, R'g'lar. ₱ lb 8¢
Hindostan No. 1, Small..₱ lb 10¢
Turkey Oil Stones, Extra, 5 to 8 in.....₱ lb 80¢
Queer Creek Stones, 4 to 8 in.20¢
Queer Creek Slips.....10¢
Sand Stone.....6¢

Dis. 25% / 33⅓%

Scythe Stones—

Pike Mfg. Co., 1907 list:
Black Diamond S. S..₱ gro. $12.00
Lamoille S. S.....₱ gro. $11.00
White Mountain S. S.₱ gro. $9.50
Green Mountain S. S.₱ gro. $7.00
Extra Indian Pond S. S.₱ gro. $8.00
No. 1 Indian Pond S. S.₱ gro. $7.50
No. 2 Indian Pond S. S.₱ gro. $5.00
Leader Red End S. S.₱ gro. $5.00
Quick Cut Emery....₱ gro. $10.00
Pure Corundum.....₱ gro. $18.00
Crescent.....$7.00
Emery Scythe Rifles, 2 Coat. $8.80
Emery Scythe Rifles, 3 Coat.$11.00
Emery Scythe Rifles, 4 Coat.$13.20
Balance of 1907 list 33⅓%.
Lectro (Artificial), ₱ gro., $12.00.33⅓%
$12.00 .....33⅓%
Lightning (Artificial), ₱ gro., $18.00 .....33⅓%

Dis. 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers.....₱ gro. $9.00

Stops— Bench—

Millers Falls.....15&10%
Morrill's, ₱ doz., No. 1, $10.00....50%
Morrill's, No. 2, $18.50.....50%
Seymour Smith & Son's.....60%

Door—

Chapin-Stephens Co.....50@50&10%

Plane—

Chapin-Stevens Co.....20%

Straps— Box—

Acme Embossed, case lots..20&10&10%
Cary's Universal, case lots...20&10&10%

Stroppers, Razor—

Pullman Safety Razor Blade, doz.$8.50

Stuffers, Sausage—

Enterprise Mfg. Co., Stuffers and Lard Presses.....25@25&7½%
P., S. & W. Co.....40&10&5%

Swings, Lawn—

Myers' Low Down Roller.....$6.25

Tacks, Finishing Nails, &c.

American Carpet Tacks.90&25@—%
American Cut Tacks..90&25@—%
Swedes' Cut Tacks.L..90&30@—%
Swedes' Upholsterers'.90&35@—%
Gimp Tacks.....90&35@—%
Lace Tacks.....90&35@—%
Trimmers' Tacks.....90&30@—%
Looking Glass Tacks.....65@—%
Bill Posters' and Railroad Tacks, 90&40@—%
Hungarian Nails.....80@—%
Finishing Nails.....70@—%
Trunk and Clout Nails.75&5@—%
NOTE.—The above prices are for Straight Weights.
See also Nails, Wire.

Double Pointed—

Double Pointed Tacks, 90&4tens@90&5tens%

Tapes, Measuring—

American Asses' Skin....50@—%
Patent Leather.....25@30&5%
Steel .....33⅓&5%
Chesterman's .....25@25&5%
Keuffel & Esser Co.:
Favorite, Ass Skin.....40&10@50%
Favorite, Duck and Leather..... 25&5@25&10%
Metallic and Steel, lower list, 25@35&5%; Pocket, 35@35&5%.

Lufkins:
Asses' Skin.....40&10@50%
Metallic .....30@30&5%
Patent Bend, Leather...25&5@25&10%
Pocket .....40@40&5%
Steel .....33⅓@33⅓%
Wiebusch & Hilger:
Chesterman's Metallic, No. 34L, etc. 25%
Chesterman's Steel, No. 1038L, etc. 33%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ¾-inch and larger per 100 lb.....$2.55@$2.80

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c.....30@35%

Ties, Bale—Steel Wire—

Single Loop.....82½&10%
Monitor, Cross Head, &c.70&2½%

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tops, Chimney—

Iwan Volcano Chimney Tops.....55%

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Ice Tools—

Gifford-Wood Co.....15%

Saw—

Atkins' Cross Cut Saw Tools.....35%
Simond's Improved.....33⅓%
Simonds' Crescent.....30%

Ship—

L. & I. J. White.....25%

Torches—

Hammers, Engine, ₱ doz.....$4.50

Traps—Fly—

Balloon, Globe or Acme, doz., $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz., $1.25@1.40; gro.$13.00@13.50

Game—

Imitation Oneida.....75@10%
Newhouse .....50&5%
Hawley & Norton.....65&10%
Victor .....75@75&10%
Oneida Community Jump.....70&5%
Stop Thief.....60%
Tree Trap.....60%
Hector .....75@75&5%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes, 12¢
Mouse, Round or Square Wire, doz. 85@90¢

Trowels—

Disston Brick and Pointing.....25%
Disston Plastering.....20%
Disston "Standard Brand" and Garden Trowels.....30%
Kohler's Steel Garden Trowels, ₱ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break, Forged Steel Garden Trowels, in 1 doz. boxes, ₱ gro, $6.50
Wm. Rose & Bros., Bricklayers' and Plasterers'.....25&5%
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

McKinney Trucks.....each, net $10.00

Tubs, Wash—

Net, per gross.

	No. 0	1	2	3
Galvanized...	*$29.00*	*$8.00*	*55.00*	*62.00*

Twine, Miscellaneous—

Flax Twine:
No. 9, ¼ and ½-lb. Balls .21@23¢
No. 12, ¼ and ½-lb. Balls. 19@21¢
No. 18, ¼ and ½-lb. Balls. 16@18¢
No. 24, ¼ and ½ -lb. Balls. 15½@17½¢
No. 36, ¼ and ½-lb. Balls. 15@17¢
Chalk Line, Cotton ½-lb. Balls .....25@30¢
Cotton Mops, 6, 9, 12 and 15 lb. to doz.....8½@21¢
Cotton Wrapping, 5 Balls to lb., according to quality....12@23¢
American 2-Ply Hemp, ¼ and ½-lb. Balls.....12½@13¢
American 3-Ply Hemp, 1-lb Balls .....13¼@16¢
India, 2-Ply Hemp, 1½-lb. Balls, Balls (Spring Twine)...7½@9¢
India 3-Ply Hemp, 1-lb. Balls 7¼@9¢
India 3-Ply Hemp, 1½-lb. Balls, 7@8¼¢
2, 3, 4 and 5-Ply Jute, 1¼-lb. Balls .....9@11¢
Mason Line, Linen, ¼-lb. Bls.17¢
No. 264 Mattress, ¼ and ½ lb. Balls, according to quality. 50@60¢
Wool, 3 to 6 ply....B 6¢; A 7½¢

Vises—

Solid Box.....60@60&10%

Parallel—

Fisher & Norris Double Screw Leg, each, Nos. 2, $10.50; 3, $16.00; 4, $20.50; 5, $27.00; 6, $32.00.....20%
Fisher-Brooks Bench and Woodworkers' Vises, No. 0, $3.80; No. 1, $5.90; No. 2, $8.25; No. 3, $10.50; No. 4, $13.50.....40%
Merrill's 25%
Millers Falls Oval Slide Pattern.60&10%
Parker's:
Victor, 20@25%; Regulars....20@25%
Vulcan's .....40@45%
Combination Pipe.....55@60%
Prentiss Vise Co.:
Patent, Bicycle, Shepard, Gipsy, Adj. Column, Lewis Adj. Jaw..25%
Rapid Transit, Heavy Chipping..30%
Bull Dog, Anchor Line, Yankee Quick Lever, Lewis Solid Jaw Eclipse Wrench Attachment...40%
Monarch 45%
Vise Jaw Caps 10%
Pullman Automatic Bench, ₱ doz., No. 1, $7.50; No. 2.....$9.50

Pipe—

Curtis & Curtis Malleable.....25%
Parker's Combination:
87 Series, 60%; 187 Series, 60&5%; No. 870, 40%.
Prentiss Vise Co.:
Blake Combination, Prentiss Combination, Prentiss.....60%
Malleable; Kearney Combination 65%
Rex Combination.....70%
Peerless Pipe Grip.....25%

Saw Filers

Disston's D 3 Clamp and Guide, ₱ doz., $24.00, 30%; Clamps.....50%
Reading .....50&10%

Wood Workers—

Prentiss Cabinet Makers'.....40%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Wads— *Price per M.*

B. E., 11 up.....60¢
B. E., 9 and 10.....70¢
B. E., 8.....80¢
B. E., 7.....80¢
P. E., 11 up.....$1.00
P. E., 9 and 10..... 1.25
P. E., 8..... 1.50
P. E., 7..... 1.50
Ely's B. E., 11 and larger.$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25

Dis. 15%

Ware, Hollow—Cast Iron, Hollow—

Stove Hollow Ware:
Enameled .....45&10%
Ground .....50&5%
Plain or Unground.....60%
Country Hollow Ware, per 100 lbs .....$2.75@$3.00
White Enameled Ware:
Maslin Kettles.....65&10%
Covered Wares:
Tinned and Turned.....35&10%
Enameled .....45&10%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware.....33⅓%
El-an-ge .....60&10%
Iron Clad Ware.....70&10%
Lava and Volcanic, Enameled..40&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Stamping Co.:
Never-Break Spiders and Griddles .....65&10%
Steel Kettles, Maslins Scotch Bowls, Tin'd.....60%
Steel Stew Pans, Stew Pots, etc., Porcelained 50%
Cleveland Stamping & Tool Co.:
Solid Steel Spiders and Griddles .....65&5%
Solid Steel Kettles.....60&5%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

No.	₱ doz.
800—Brass King, Single Surface, Open Back	$3.00
801—Brass King, Single Surface, Open Back	$2.50
802—Brass Junior, Single Surface, Open Back	$2.25
862—White Hen, Spiral Crimp Glass	$3.15
964—Royal Blue Enamel, Single Surface, Ventilated Back	$3.25
172—Our Best, Single Zinc, Soap Drainer	$3.25
722—Soap Saver, Single Zinc, Iron Top	$3.35
100—Northern Queen, Single Zinc, Perforated, Open Back	$3.00
134—Universal, Single Zinc, Extra Family Size, Ventilated Back	$2.80
710—Regal, Single Zinc, Extra Family Size, Ventilated Back	$2.50
760—Banner Globe, Single Zinc, Ventilated Back	$2.25
57—Peerless, Double Zinc, Spring Protector	$3.70
56—Red Cross, Double Zinc, Swing Protector	$3.60
17—North Star, Solid Zinc, Swing Protector	$3.60
797—Jewel, Single Zinc, Fall Size.	$1.25

Washers—Leather, Axle—

Solid .....90@90&10%
Patent .....90@90&5%
Coil: ¾ 1 1¼ 1¼ *inch.*
9¢ 10¢ 11¢ 14¢ *per box.*

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers....$4.90 4.00 2.70 2.50 2.30
The above prices are based on $6.50 off list.
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.
Avery Stamping Co.:
Standard, in 200 lb kegs, $6.00 ₱ 100 lb. discl.; in 100 lb kegs, add 10¢ net ₱ 100 lb; in 5 or 10 lb boxes, add 50¢ net ₱ 100 lb; in 1 lb boxes, add $1.00 net ₱ 100 lb.

Cast Washers—

Over ½-inch, barrel lots, per lb. 1½@1¾¢

Wedges—

Oil Finish.....lb., 2¼@2¾¢

Weights—Hitching—

Covert Mfg. Co.....25%

Sash—

Per net ton, Eastern market, $25.00@—

Wheels, Corundum and Emery—

Pike Mfg. Co., Corundum, 65%; Emery 75%

Well—

8-in., $2.00; 10-in., $2.30; 12-in., $3.00; 14-in., $4.45.

Wire and Wire Goods—

Market and Stone Wire in Bundles—

Bright and Annealed:
9 and coarser.....80%
10 to 18.....80&10%
19 to 26.....80&10&2½%
27 to 36.....80&5%
Galvanized:
9 and coarser.....75&10%
10 to 16.....75&10%
17 to 26.....72½&10%
27 to 36.....72½%
Coppered:
9 and coarser.....75&10%
10 to 26.....75&10%
27 to 36.....70&10&5%
Tinned:
6 to 18.....75&10&10%
Brass.....15¾¢ lb., base
Copper .....14½¢ lb., base
Cast Steel Wire.....50%

Spooled Wire—

Annealed and Tinned, 70&10&10&10%
Brass and Copper...60&10&10&10%
Retailers' Assortments, per box, $1.90@$2.10

Bright Wire Goods—

Steel Wire Goods, 90&20@90&20&10%
Brass Wire Goods, 90&20@90&20&10%
Brass Cup and Shoulder Hooks, 85%

Wire Cloth and Netting—

Galvanized Poultry Netting, 80&10&5%
Screen Cloth, 12 Mesh, Per 100 sq. ft.; Painted, $1.35; Galvanized, $1.95; 14 Mesh, Bronze $6.50
Standard Galv. Hardware Grade: 100 ft. rolls, 2½ to 48 in. wide, Per 100 sq. ft.
Nos. 2, 2½ and 3 Mesh....$2.50
Nos. 4 and 5 Mesh.....$2.75
No. 6 Mesh.....$3.00
Nos. 7 and 8 Mesh.....$3.50

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural .....75&10@80&5%
Alligator or Crocodile.70&10@75%
Baxter Pattern S Wrenches, 70&5@70&10%
Drop Forged S.....45@45&5%
Acme .....60&10%
Alligator Pattern, 70%; Bull Dog..70%
Hemis & Call's:
Adjustable S, 40&5%; Adjustable S Pipe, 40&5%; Briggs Pattern, 40%; Combination Bright, 50%.
Steel Handle Nut.....50&5%
Combination Black.....50&5%
Merrick Pattern.....50&5%
Coes' Genuine Knife Hdl...40&10&5%
Coes' Genuine Steel Hdl...40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes' Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics'"...40&10&5&5%
Hercules 70%
W. & B. Machinist:
Case lots.....50&10%
Less than case lots.....50%
W. & B. Railroad Special:
Case lots.....50%
Less than case lots.....40&10&5%
Solid Handles, P., S. & W..50&10%; full cases.....50&10&5%
Vulcan and Agrippa Chain.....50%
Wizard Adjustable Ratchet.....50%

Can and Jar—

Bent, P. Forbes Triumph, doz., $0.75; Triumph Syrup Cap, gro. $1.00

Wrought Goods—

Staple Hooks, &c., list March 17, '08.....90@—%

Zinc—

(Cask lots, 600 lb., at mill.)
Sheet.....per 100 lb., $8.00

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1⅝ in. round and square; 1½ to 4 in. x ⅜ to 1 in.	₩ lb 2.10¢
1½ to 4 in. x ⅛ to 5-16	₩ lb 2.20¢
Rods—⅝ and 11-16 round and square	₩ lb 2.20¢

Angles: Cts ₩ lb

3 in. x ¼ in. and larger	2.20¢
3 in. x 3 16 in. and ⅛ in.	2.45¢
1½ to 2½ in. x ⅛ in.	2.25¢
1½ to 2¾ in. x 3-16 in. and thicker	2.15¢
1 to 1¼ in. x 3-16 in.	2.25¢
1 to 1¼ x ⅛ in.	2.30¢
⅞ x ⅛ in.	2.45¢
¾ x ⅛ in.	2.55¢
⅝ x ⅛ in.	3.60¢
½ x 3-32 in.	4.15¢

Tees:

1 in.	2.55¢
1¼ in.	2.35¢
1½ to 2½ in.	2.20¢
3 in. and larger	2.25¢
Beams	2.20¢
Channels, 3 in. and larger	2.20¢
Bands—1½ to 6 x 3-16 to No. 8	2.35¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H B. & S." Iron, base price	2.95¢
Norway Bars	3.30¢

Merchant Steel from Store—

	per lb
Bessemer Machinery	2.00¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black

	One Pass, C.R Soft Steel.	R. G. Cleaned
No. 16	₩ lb 2.80¢	2.90¢
Nos. 18 to 21	₩ lb 2.85¢	3.00¢
Nos. 22 and 24	₩ lb 2.95¢	3.10¢
No. 26	₩ lb 3.00¢	3.20¢
No. 28	₩ lb 3.10¢	3.40¢

Russia, Planished, &c.

Genuine Russia, according to assortment, ₩ lb 12 @14½

Patent Planished, W. Dewees Wood, ₩ lb A, 10¢; B, 9¢ net.

Galvanized.

Nos. 14 to 16	₩ lb, 2.95¢
Nos. 22 to 24	₩ lb, 3.30¢
No. 26	₩ lb, 3.50¢
No. 28	₩ lb, 3.85¢

No. 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	₩ lb .5 75¢
No. 26	₩ lb .6.25¢
No. 28	₩ lb .7 25¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd.
No. 24	₩ 100 sq. ft. $3.85	4.80
No. 26	₩ 100 sq. ft. 2.95	4.00
No. 28	₩ 100 sq. ft. 2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:

IC, 14 x 20	$6.25
IX, 14 x 20	7.50

A. Charcoal:

IC, 14 x 20	$5.80
IX, 14 x 20	6.40

American Coke Plates—Bessemer-

IC, 14 x 20	107 lb	$4.30
IX, 14 x 20		5.30

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8 30
IX, 20 x 28 with an 8 lb. coating	10.30

Seamless Brass Tubes—

List December 4, 1905. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List December 4, 1905. Base price 18¢

Copper Tubes—

List December 4, 1905. Base price 22¢

Brazed Brass Tubes—

List August 1, 1908. 20¾¢ ₩ lb

High Brass Rods—

List August 1, 1908. 14¼¢ ₩ lb

Roll and Sheet Brass—

List August 1, 1908. 14½¢ ₩ lb

Brass Wire—

List August 1, 1908. 14½¢ ₩ lb

Copper Wire—

Base Price, Carload lots mill 14¾¢

METALS—

Tin—

Straits Pig	₩ lb 33 @33¼¢

Copper—

Lake Ingot	₩ lb 14¾@15 ¢
Electrolytic	₩ lb 14½@15 ¢
Casting	₩ lb 14 @14½¢

Sheet Copper Hot Rolled, 16 oz (quantity lots) ₩ lb 17 ¢

Sheet Copper Cold Rolled, 1¢ ₩ lb advance over Hot Rolled.

Sheet Copper Polished 20 in. wide and under, 1¢ ₩ square foot.

Sheet Copper Polished over 20 in. wide, 2¢ ₩ square foot.

Planished Copper, 1¢ ₩ square foot more than Polished.

Spelter—

Western ₩ lb 7¼@7¼¢

Zinc.

No 9, base, casks ₩ lb 8½¢ | Open ₩ lb 9¢

Lead.

American Pig	₩ lb 5¼@5¼¢
Bar	₩ lb 6¼@6¼¢

Solder.

½ & ½, guaranteed	₩ lb 20¼@20¾¢
No. 1	₩ lb 17¾@18¼¢
Refined	₩ lb 16 @16¼¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ lb . @10¢
Hallette	@9½¢
Other Brands	@9 ¢

Bismuth—

Per. lb $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting 24¢

Rods & Wire	Base Price 31¢
Sheets	Base Price 33¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₩ lb 11.25@11.50
Copper, Heavy and Wire	₩ lb 10.75@11.00
Copper, Light and Bottoms	₩ lb 9.75@10.00
Brass, Heavy	₩ lb 7.50@ 7.75
Brass, Light	₩ lb 6.00@ 6 25
Heavy Machine Composition	₩ lb 10 00@10.25
Clean Brass Turnings	₩ lb 7.00@ 7.25
Composition Turnings	₩ lb 8.00@ 8.25
Lead, Heavy	₩ lb ... @ 3.75
Lead Tea	₩ lb ....@ 3.50
Zinc Scrap	₩ lb ....@ 3.50

THE IRON AGE

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